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International Journal of Special Education

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AN ASSESSMENT OF THE LEVEL OF INFLUENCE OF FAMILY LIFE AND HIV/AIDS EDUCATION ON KNOWLEDGE, ATTITUDE AND DECISION MAKING AMONG ADOLESCENTS WITH HEARING IMPAIRMENT IN SOME STATES IN NIGERIA

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This study investigated knowledge, attitude and decision making on HIV/AIDS among adolescents with hearing impairment in Oyo, Lagos and Kwara States. Seventy-six respondents participated in the study with age range between 16 and 20. The research adopted a descriptive survey research design. Seventy-six students with hearing impairment participated in the study. Three hypotheses were postulated and tested. The main instrument used to gather data was Family Life and HIV/AIDS Education inventory with reliability coefficient of 0.73. Chi square and Student t-test methods at alpha level of 0.05 were used to analyze the data collected. The findings revealed that there were significant differences in knowledge, attitude and decision making of adolescents with hearing impairment as a result of Family Life and HIV/AIDS Education (FLHE). On the basis of the positive outcome, the study further recommended some ways of improving the effectiveness of Family Life and HIV/AIDS Education to be able to achieve the desired result among adolescents with hearing impairment and adolescents generally.

Introduction

Background to the Study
Nigerian adolescents are plagued with social and moral decadence ranging from indecent dressing, drug addiction, pornographic attachment, hooliganism, abortion, teenage pregnancy to rising incidence of sexually transmitted diseases and HIV/AIDS. The causes have been traced to loss of values, rapid urbanization, modernization, economic depression, acculturation, parents’ lust after wealth and non-inclusion of a well defined sexuality education in the curriculum. The effects of all these, according to Ademokoya and Oyewumi (2001), would lead to uninformed or misinformed youths. The health implication on this productive group may be devastating.

In recent times, HIV/AIDS, believed globally to constitute a health hazard has a high incidence among adolescents. Human Immunodeficiency Virus (HIV) infection is a profound immune dysfunction that allows for opportunistic infections in Acquired Immuno Deficiency Syndrome (AIDS) patients. Acquired Immunodeficiency Syndrome (AIDS) has become a major global public health issue since its discovery in 1981 (Osowole & Oladepo, 2001; Fakolade, Adeniyi, & Tella, 2005).

UNAIDS (2006) reported that an estimate of 25 million people have been killed worldwide since HIV/AIDS was first discovered in December 1981. In Nigeria also, the infection has continued to spread steadily since it was first diagnosed in 1986. The prevalence level increases from 1.8% zero prevalence in 1999 to 3.8% in 1994, 4.5% in 1996, 5.4 in 1999 and 5.8% in 2001 with a high proportion among adolescents aged 15-24 (Federal Ministry of Health & Social Science, 1999).

The consistent and alarming growing rate among youths especially adolescents with and without disabilities point to the fact that adolescents are sexually active and often take risks with little reflection.
on the consequences (Fakolade, Adeniyi, & Tella, 2005). Unfortunately, majority of these young adults especially adolescents with hearing impairment are grossly ignorant of consequences of unprotected and unguided sexual activity. This may be due to break in communication and information.

Already, many awareness campaigns have been carried out to intimate the youths of the impending danger of risk sexual behaviour. The campaigns have majorly centred on adolescents without disabilities (Fakolade, Adeniyi, & Tella, 2005; Osowole & Oladepo, 2001). The disabled especially the hearing impaired of Nigeria population is seriously at risk and stand double jeopardy in relation to information and education on HIV/AIDS (Ademokoya & Oyewumi, 2001).

Research by Bisol, Sperb, Brewer, Kato and Shor-Posner (2008) on HIV/AIDS knowledge and health-related behaviour of hearing and deaf indicated wide differences in health-related attitude and behaviour. The deaf participants were found to be sexually abused and large numbers of female deaf adolescents have AIDS infected friends. A similar revelation was made by Osowole and Oladepo (2001) in their study on knowledge, attitude and perceived susceptibility to AIDS among 304 deaf secondary school students. The result revealed a high level of awareness of HIV/AIDS with demonstrated gap in knowledge of causation, transmission and prevention coupled with low attitudinal disposition. Bekele (2008) and Groce, Yousa Fzai and Van-der Mass (2008) also found that adolescents with hearing impairment have low knowledge of the spread of sexually transmitted infections especially HIV/AIDS. Fakolade, Adeniyi, and Tella (2005) in their study recorded similarity in the awareness of HIV/AIDS by adolescents with and without hearing impairment but discovered a wide gap and disparity in knowledge about HIV/AIDS transmission or spread.

However, Doyle (1995) surveyed AIDS knowledge, attitude and behaviour among college deaf students found high and moderate in knowledge and attitude respectively among the participants. The result of this study was not enough evidence for generalization, but the causes of the poor knowledge, negative attitude and unhealthy decision making were generally linked with societal perception and neglect as regard dissemination of vital information. The special-needs students, especially those with hearing impairment, unlike non special-needs individuals, acquire less information from sources such as books, casual conversation and television (Ademokoya & Oyewumi, 2004). This is because they experienced some challenges in internalizing verbal language and often confuse some human activities on electronic media because of their auditory dysfunction. Therefore, they have unmet needs as regarding these sources.

Akinyemi (1998) noted that the deaf adolescents’ inability to hear and speak often make it very difficult to disseminate sex information to them. This impediment stems out of the fact that most technical and scientific languages to be used have no sign language representation. The consequence is that they are heavily burdened in term of acquisition of information about sexuality and hence engage in risky sexual behaviour. An inherent danger in this unfortunate development is that the uninformed, misinformed or insufficiently informed adolescents with hearing impairment who continue to go on having unprotected reckless sexual adventures would continue infesting or spreading the yet-to-get-cure disease, AIDS.

The documentary evidence of casual sex, teenage pregnancy, the rising incidence of sexually transmitted infections (STIs) and HIV/AIDS among youths is an indication that there is a need for a formalized programme on sexuality and sex-related issue among adolescents (Falaye & Moronkola, 1999). Such programme must be the one that will empower the adolescents and adolescents with hearing impairment the necessary skills and information that will positively affect their sexual health.

The incorporation of Family Life and HIV/AIDS Education (FLHE) to schools at all levels in Nigeria is a programme that aim at development of skills, acquisition of knowledge and promotion of right attitude and decision making among adolescents generally. This is reflected in curriculum contents and strategies for programme dissemination as packaged in the blueprint.

Family Life and HIV/AIDS Education (FLHE) is a planned process of education that fosters the acquisition of factual information, formation of positive attitudes, beliefs and value as well as development of skills to cope with biological, physiological, socio-cultural and spiritual aspects of human being (NERDC, 2003). In essence, Family Life and HIV/AIDS Education will teach knowledge of self and family living respect for self and culture as well as the right kind of behaviour in children, young adults and adults.
The main goal of Family Life and HIV/AIDS Education (FLHE) as enunciated in the blueprints is to promote preventive education by providing learners with opportunities to develop a positive and factual view of self, acquire the information and skills needed to take care of their health. The curriculum of Family Life and HIV/AIDS Education (FLHE) is also designed to teach adolescents how to respect and value themselves and others, and acquire the needed skills to make healthy decision about their sexual health and behaviour.

Ibeagha, Adedimeji, Okpala and Ibeagha (1999) conducted research on the involvement of churches in the provision of Family Life and HIV/AIDS Education in eight local government areas of Oyo State. The study revealed that the programme was a worthwhile exercise and highly instructive.

Although, Family Life and HIV/AIDS Education have been introduced into school curriculum in Nigeria, its effectiveness has not been fully explored. This study therefore investigated the effectiveness of Family Life and HIV/AIDS Education as it affects knowledge, attitude and decision making of adolescents with hearing impairment in the wake of the sporadic spread of HIV/AIDS.

Statement of the Problem

Obviously, adolescents are vulnerable to so many vices in the society. One of such is unprotected sexual activities that have accounted for the spread of HIV/AIDS worldwide. The reason can be adduced to dramatic change in societal value due to modernization and economic depression. Apart from the universal predisposing factors, adolescents with hearing impairment are further plagued with limited and or inadequate information about HIV/AIDS and how it spread. This is because of societal disposition which conspicuously reflect in planning and implementation of various programmes targeted towards improving sexual health of adolescents with hearing impairment. This is obvious in the depth of their knowledge of attitude to HIV/AIDS and inability to gird their sexual activities which has made the issue of the global epidemic to be difficult to control among adolescents generally. Therefore, this research work is necessary at this particular period when there is groaning concern for reduction and elimination of HIV/AIDS among entire population of the world.

Statement of Hypotheses

In this study, three null hypotheses were generated and tested for significance at 0.05. These include:

1. There will be no significant difference in the knowledge about HIV/AIDS as a result of Family Life and HIV/AIDS Education (FLHE) between male and female adolescents with hearing impairment.

2. There will be no significant difference in the attitude of the participants (male and female) to HIV/AIDS as a result of Family Life and HIV/AIDS Education (FLHE).

3. There will be no significant difference in the decision making of adolescent with hearing impairment as a result of Family Life and HIV/AIDS Education (FLHE).

Method

Research Design

Survey research design was adopted in this study. With this design, systematic inquiry on Family Life and HIV/AIDS Education related knowledge, attitude and decision making of adolescents with hearing impairment was conducted without manipulation of the variables. Structured questionnaire was used to elicit response in each of the variables.

Sample and Sampling Procedures

The participants in this study were seventy-six secondary school adolescents with hearing impairment randomly selected from Methodist Grammar School, Bodija, Ibadan; Ijokodo High School, Ibadan, all in Oyo State, Wesley School for the Deaf at Surulere, Lagos, Lagos State and Kwara State School for the Handicap, Secondary School Unit in Ilorin, Kwara State. The schools are located in the Southwestern and North Central parts of Nigeria. Family Life and HIV/AIDS Education Inventory (FLHE) were used in order to investigate knowledge, attitude and decision-making of the adolescents. Out of this number 33 (43.42%) were males while 43 (56.58%) were females. The participants were believed to have been exposed to Family Life and HIV/AIDS Education for some period of time by their own schools.
**Instrumentation**

The instrument used for this study was a self designed Family Life and HIV/AIDS Education Inventory (FLHEQ). The instrument was divided into two sections (A & B). Section A was for demographic data of the respondents. Section B was divided into three sub-sections based on the variables under investigation.

The instrument was validated by subjecting the questionnaire to experts’ opinions of four psychologists from the Departments of Guidance and Counselling and Special Education, University of Ibadan. The reliability of the instrument was 0.73 using Cronbach alpha method.

Some example of questions included: can Family Life and HIV/AIDS Education prevent the occurrence and spread of HIV/AIDS? (Yes/No), I believe there is nothing wrong with boys and girls having sexual intercourse if they love each other even though they have knowledge of Family Life and HIV/AIDS Education (SD = Strongly Disagree, D = Disagree, A = Agree and SA = Strongly Agree). An example of question related to decision-making is: I would never contemplate on having sex before marriage (SD = Strongly Disagree, D = Disagree, A = Agree and SA = Strongly Agree).

**Data Analysis**

Chi square and student t-test statistical methods were employed for the analysis of data collected from the instruments used. The analyses tested the significant differences among the variables. The results of these analyses were used to test the three hypotheses generated in this study.

**Results**

*Null Hypothesis One*

The null hypothesis one states that there will be no significant difference in the level of knowledge about HIV/AIDS as a result of Family Life and HIV/AIDS Education (FLHE) between male and female participants. The results of hypothesis one are presented on Table 1.

**Table 1: Chi-square Table Showing the Level of Knowledge about Family Life and HIV/AIDS Education (FLHE) among the Participants**

<table>
<thead>
<tr>
<th>Sex</th>
<th>Yes Obtained</th>
<th>Yes Expected</th>
<th>No Obtained</th>
<th>No Expected</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>228</td>
<td>250.1</td>
<td>102</td>
<td>79.89</td>
<td>330</td>
</tr>
<tr>
<td>Female</td>
<td>348</td>
<td>325.90</td>
<td>82</td>
<td>104.14</td>
<td>430</td>
</tr>
<tr>
<td>Total</td>
<td>576</td>
<td></td>
<td>184</td>
<td></td>
<td>766</td>
</tr>
</tbody>
</table>

Note: Calculated chi square = 14.27, Table Chi-square value = 7.82, Level of Significance = 0.05, Degree of Freedom = 3

14.27 > 7.82 @ 0.05, S* = Significant at 0.05

The result from table one above revealed that there is significant difference in the level of knowledge of HIV/AIDS among participants since the calculated chi square of 14.27 is significantly greater than the critical value of 7.82 (14.27 > 7.82). The hypothesis is therefore rejected.

*Null Hypothesis Two*

The null hypothesis two states that there will be no significant difference in the attitude of the participants to HIV/AIDS as a result of Family Life and HIV/AIDS Education (FLHE). The results of hypothesis two are presented on Table 2.

**Table 2: t-test Comparison of Attitude towards HIV/AIDS among the Participants**

<table>
<thead>
<tr>
<th>Variables</th>
<th>N</th>
<th>(\bar{X})</th>
<th>SD</th>
<th>df</th>
<th>t-cal</th>
<th>t-crit</th>
<th>P</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>33</td>
<td>37.33</td>
<td>2.35</td>
<td></td>
<td>6.39</td>
<td>1.98</td>
<td>0.05</td>
<td>S*</td>
</tr>
<tr>
<td>Female</td>
<td>43</td>
<td>39.72</td>
<td>2.81</td>
<td>74</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

S* = Significant at 0.05
The result of the table above indicated that there is significant difference in the attitude of the participants to HIV/AIDS as a result of Family Life and HIV/AIDS Education. This is because the t-calculated of 6.39 is significantly greater than the critical value of 1.98 at 0.05 (i.e. 6.39 > 1.98). The null hypothesis two is therefore rejected.

Null Hypothesis Three
The null hypothesis three states that there will be no significant difference in the decision making as a result of Family Life and HIV/AIDS Education (FLHE) among the participants. The results of hypothesis three are presented on Table 3.

Table 3: T-test Comparison of Decision Making as a Result of Family Life and HIV/AIDS Education (FLHE) among the Participants

<table>
<thead>
<tr>
<th>Variables</th>
<th>N</th>
<th>$\bar{X}$</th>
<th>SD</th>
<th>df</th>
<th>t-cal</th>
<th>t-crit</th>
<th>P</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>33</td>
<td>30.33</td>
<td>1.30</td>
<td></td>
<td>74</td>
<td>5.58</td>
<td>1.98</td>
<td>0.05</td>
</tr>
<tr>
<td>Female</td>
<td>43</td>
<td>31.67</td>
<td>0.74</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

S* = Significant at 0.05**

The result from the table three above revealed that there is a significant difference in the decision making as a result of Family Life and HIV/AIDS Education (FLHE) among male and female participants since the t-calculated value of 5.58 is significantly greater than the critical value of 1.98 (i.e. 5.587 > 1.98) at 0.05. The null hypothesis is therefore rejected.

Discussion
The analyses of the three hypotheses revealed that there was significant improvement in knowledge, attitude and decision making patterns among adolescents with hearing impairment on the issue of HIV/AIDS as a result of Family Life and HIV/AIDS Education (FLHE) since 2003. The finding of this study revealed that Family Life and HIV/AIDS Education have proved significantly effective in changing sexual behaviour of adolescents with hearing impairment. These results contradict various findings that reported low knowledge and poor decision-making pattern HIV/AIDS among adolescents, especially adolescents with hearing impairment. According to the findings of this study, Family Life and HIV/AIDS Education has significantly increased awareness, improved knowledge of and changed attitude of adolescence with hearing impairment to risky sexual behaviour that can lead to infection of HIV/AIDS. The findings corroborated Mukkhopadhya and Abosi (2004) who found awareness and knowledge about HIV/AIDS to be very high among students with and without hearing impairment in Botswana. It was also supported by Doyle (1995) that found relatively high general knowledge about AIDS among eighty four college students. Gesinde (2008) in a related study found that the degree of awareness and knowledge about HIV/AIDS among one hundred and three randomly selected hearing impaired students of Federal College of Education (Special), Oyo was generally moderate.

In addition, the finding of this study lend support to the outcome of research carried out on involving the church in the provision of Christian Family Life Education by Jonathan-Ibeagha, Adedimeji, Okpala and Ibeagha (1999). Christian Family Life Education was considered to be significantly helpful in that it involves the teaching of spiritual and social skills that will help adolescents to cope with life challenges. This was evident in the dispositions of the selected adolescents trained to be trainers of their peers in eight local government areas in Oyo State.

Furthermore, female adolescents recorded higher mean scores than their male counterpart. The implication is that female adolescents with hearing impairment responded more positively to information about HIV/AIDS as a result of Family Life and HIV/AIDS Education (FLHE, 2003). This corroborated research by Okubanjo (2001) who found significant difference between male and female awareness scores. They attributed this to the fact that male gender bothers less about the consequences of risk sexual behaviour.
Conclusion
This study explored Family Life and HIV/AIDS Education’s (FLHE) influence on knowledge, attitude and decision making among adolescents with hearing impairment. The outcome of the finding revealed that Family Life and HIV/AIDS Education (FLHE) will be of immense benefit to the adolescents with and without hearing impairment. Hence, all stakeholders must use this research finding as basis to develop strategies to teach sexuality education so as to curb the spread of HIV/AIDS worldwide.

Recommendations
It is obvious that Family Life and HIV/AIDS Education (FLHE) can promote behavioural change among adolescents especially adolescents with hearing impairment to the issue of sexual risk behaviour which is widely believed to be the floodgate to the spread of HIV/AIDS. However, unskillful implementation of the programme may mar the unequal benefits the generation of youths and society at large may derive from it. Hence, it is recommended that government should be more involved in programmes aimed at improving the health status of the society by allocating more funds for it. There should also be monitoring of the programme and taking of appropriate action on any report submitted on weakness and progress of the programme. Teachers in conventional and specialised schools should be retrained in order to furnish them with new ideas and strategies to convey all aspects of sexuality education to the hearing impaired. Specialists in special education should be encouraged to evolve signs that will represent some technical words used in the FLHE programme as this will bridge the gap of communication and information among the hearing and hearing impaired. Parents and guardians should partner with appropriate authority to see that programmes on HIV/AIDS are attended to by all stakeholders using Family Life and HIV/AIDS Education (FLHE) blueprints.

References


AN EXAMINATION OF TEACHER ACCEPTANCE OF HANDHELD COMPUTERS

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As states and federal legislation have invested in integration of new technologies into education, the teacher’s role as the user of such technologies in the classroom becomes more prominent (Telecommunications Act of 1996). However, relevant prior research suggests that teacher resistance to new technologies remains high. This study explores teachers’ acceptance of handheld computer use, and identifies key intention determinants for using this technology based on a modified version of the technology acceptance model. The new model with five constructs—(1) perceived ease of use, (2) perceived usefulness, (3) subjective norms, (4) intention to use, and (5) dependability—was tested using the handheld computer acceptance survey responses from 45 special education teachers grouped into four groups by experience of using technology for data collection. The results showed that the direct effect of two constructs, perceived usefulness and perceived ease of use, on intention to use a handheld computer was statistically significant. The dependability factor, which was not included in any prior technology acceptance literature, had a statistically significant effect on perceived ease of use and usefulness, and intention to use a handheld computer, respectively. Groups of participants differed on only subjective norm. Theoretical and practical implications were also discussed.

This study carefully examines an emerging special educational technology, handheld computers. While this technology is not new, its emerging presence in special education classes merits careful review and examination for the salient factors relating to its viability for its intended purpose. As the job of special educators grows more laden with accountability for individualized education programs (IEP) that require direct observation of behavior in dynamic and interactive settings, administrators seek ways to streamline this job for special education teachers. Handheld computers are being considered as one of the ways by bringing the advantages of desktop and laptop computers to educators and researchers to be able to gather just in time (cf. Bruckner & Tjoa, 2001; McGhee & Kozma, 2003) data that can be used in support of learning and making sound educational decisions (Brown, Lovett, Bajzek, & Burnette, 2006). One serious concern is that lost, inappropriately stored, and poorly organized data can hinder the efficiency as well as issues related to teacher error in using the device. Therefore, it is paramount that the use of handheld devices for collecting and storing just in time educational data for accountability be studied and reported to facilitate school district decision making and to possibly influence legislator support for allocating funds to support the purchase of and training on handheld computers.

When new technologies are integrated into existing settings or processes there is a risk that these resources may be inadequately utilized or misused. Adaptation and adoption of such resources are dependent on factors such as willingness acceptance by users, familiarity with the technology components, availability of appropriate resources, and design of the user interface and data entry formats (Legris, Ingham, & Collerette, 2003). Accordingly, users often resist an unplanned and inappropriately applied technology. Consequently, hardware, software and user satisfaction must be considered to help ensure the smooth implementation of any system.
Education stakeholders have invested significant time and financial resources introducing technology to schools and teachers. In their study, Booth, Wilkie, and Foster (1994) stated a common assumption that if new technology is introduced, then it will be accepted and used (p. 1). However, success is possible only when teachers agree to actually utilize the technology in instructional and administrative tasks (Paraskeva, Bouta, & Papagianna, 2008; Smarkola, 2007; Teo, Lee, & Chai, 2008). In their meta-analyses, Legris et al. (2003) concluded that teachers’ attitudes toward technology and its perceived usefulness are significant determinants of behavior that may influence teachers’ success in high-level use of technology in instruction. This idea originated in Davis’ (1989) study that indicated the determinants of computer acceptance based on belief-attitude-intention-behavior relationship and resulted in the Technology Acceptance Model (TAM). However, TAM has been criticized, namely for being independent from the organizational context and having only two constructs. To address this constraint, many subsequent studies based on this model or extending it have been conducted related to educational contexts and have found that teacher acceptance is a key factor in the effective implementation of technology to support instruction (Gao, 2005; Kellenberger & Hendricks, 2003; Ma, Andersson, & Streith, 2005; Myers & Halpin, 2002; Ngai, Poon, & Chan, 2007; Pan, Sivo, Gunter, & Cornell, 2005; Pituch & Lee, 2006).

There are many studies in the literature stating that handheld computers are dependable tools and can be used as an alternative to traditional technologies, particularly in data collection (Adiguzel, Vannest, & Zellner, 2009; Crawford & Vahey, 2002; Trapl et al., 2005). Using reliable and dependable technology is critical for educators, because such factors determine a teacher’s intention on a technology, the technology’s usefulness, and the accuracy of the data collected. This documentation of reliability and effectiveness is a promising key factor for special education settings, where teachers need this type of technology to monitor progress on a student’s IEP (Schaff, Jerome, Behrmann, & Sprague, 2005). Thus, handheld computers can be relevant tools for special education teachers, enabling them to walk around, monitor, and track student behavior where the actions take place, and to access student information and organize the details of daily teaching activities in one small, portable device that can be used anywhere and at any time (Adiguzel, Vannest, & Parker, 2009).

This study focuses on handheld computers that are particularly useful for special education applications. In order to increase the acceptance and use of handheld computers and to accelerate their integration in schools, it is necessary to study special education teachers’ acceptance of this technology in school settings.

**Theoretical Background**

Technology acceptance is a complex construct, influenced not only by the type of technology and its purpose, but also by a cluster of variables that influence the adoption and application of technologies (Wolfe, Bjornstad, Russell, & Kerchner, 2002). Among these are the user’s perceptions of social acceptability, confidence in his or her ability to use the device, and willingness to engage in training (Davis, Bagozzi, & Warshaw, 1989). Understanding what specific variables influence teachers’ acceptance of technology and assessing the level of device acceptability among teachers can be measured by evaluating teachers’ attitudes, intentions to use the device, perceived usefulness, and perceived ease of use (Davis et al., 1989).

There are two important factors that may mediate teacher’s perceived usefulness and perceived ease of use when using computers for instructional and research purposes. The first factor was identified by Pavlou, Liang, and Xue (2007) who claimed that uncertainty can mitigate acceptance of a new technology. This is, given the high-stakes nature of the observations and grading of students with individual education plans may create a situation where they may find it difficult to adopt an untried technology. So regardless of perceived usefulness, the uncertainty related to dependability and data storage or security may negatively impact adoption of the technology. The second factor was identified by Ford, Duncan, Bedeian, Ginter, Rousculp, and Adams (2003) who claimed that regardless of other factors not fully understanding how the back office portion of the technology works creates mistrust of the technology and may lead to feeling out of control yet responsible for the ultimate outcome. This situation was described as feelings of culpability for the task at hand but not being in control of the mechanism on which they will depend. This condition may result in the tentative or superficial adoption of the technology but clearly suffers from perceptions of ease of use and usability because they are busy retaining their former practices and then duplicating their work in trying to learn and use the newer technology which accounts for lower scores on their perceptions.
In their study of teachers’ acceptance and use of technology, Hu, Clark, and Ma (2003) concluded that teachers want to know that their adoption and utilization of technology will help them meet their school’s goals and their own goals for the classroom. Thus, the ability of technological devices must be considered to help achieve both micro (classroom) and macro (school/district) level goals, and administrators and policy makers should determine how they can leverage existing empirical and anecdotal evidence to convince teachers that handheld computers are, in fact, acceptable for both types of goal achievement.

**Handheld Computers**

When compared to conventional desktop and laptop computers, handheld computers are generally perceived to offer greater portability at a more affordable cost generally between $100 and $400 (Bell, 2006). Handheld computers, which weigh on average less than half a pound, are smaller, lighter, and easier to maneuver than larger and heavier laptops, and offer portability that desktop computers cannot provide (Fletcher, Erickson, Toomey, & Wagenaar, 2003; Trapl et al., 2005). In addition, handheld computers with advanced multimedia capabilities and networking features are ideal for schools that require operating systems that have more power, are easier to use, and are more flexible in a wireless network setting. Although the documented benefits of handheld computers for school environments are substantial, the powerful uses of these computers are not yet widespread and the dynamics that influence the dependability and acceptability of these devices need to be understood.

**Key Intention Determinants for Using Handheld Computers**

Literature discusses many factors for adaptation and adoption of new technologies. Among these are: (a) perceptions regarding ease of use of handheld computers; (b) perceptions regarding the usefulness of handheld computers; (c) subjective norm; (d) the handheld computer’s dependability; and (e) perceptions regarding the intention to use handheld computers. Each of these five variables must be considered regarding the use and efficacy of technology in general and of handheld computers in particular.

Perceptions regarding ease of use of handheld computers. Ease of use is a particularly important construct with respect to technology adoption and continued use (Davis et al., 1989). The phrase *ease of use* refers to the extent to which a person believes that using a technology will not require excessive mental and physical effort to implement (Davis et al., 1989). In particular, ease of use is the potential technology user’s confidence that he or she will not be required to invest substantial amounts of time, energy, or effort learning to use the technology and maximize its functional capabilities. For example, teachers may feel compelled to learn about technology independently if they believe that its use will benefit teaching, classroom management, and student outcomes; however, expecting teachers to independently pursue learning opportunities in the field of technology use may be unrealistic on the part of administrators, because teachers are already overburdened and overextended with an array of responsibilities.

Perceptions regarding the ease of use of software and hardware technologies are influenced not only by concrete factors such as the teacher’s actual ability to manipulate a technological device and use it for an intended purpose, but also by psychological factors, including the teacher’s beliefs about the utility of a device and the role that it can play in classroom activities (Windschitl & Sahl, 2002). These authors point out that the degree to which school administrators believe in teachers’ abilities to use technology effectively and the value they place on the technology itself are significant variables that influence teachers’ perceptions regarding the devices’ ease of use. The tone that is established and conveyed by the institutional culture, then, is a significant predictor of the perception that technology is easy to use and that learning how to use it effectively is possible.

Establishing an organizational culture that embraces technology plays a significant role in shaping teachers’ perceptions of the utility of handheld computers. According to Zhao and Cziko (2001), teachers’ perceptions of the utility of handheld computers and other computer technologies for classroom use are influenced by three principal beliefs: (a) that technology can more effectively meet a higher-level goal than what [ever other means have] been used; (b) that the use of such a computer will not disrupt classroom instruction and other higher-level goals that he or she thinks are more important than the one being maintained; and (c) that teachers will receive the training and ongoing support necessary to make the computer a useful tool (p. 5).
Perceptions regarding the usefulness of handheld computers. Whether policy makers present empirical or anecdotal evidence to teachers or administrators—or ideally, both—they must take a broad approach to the definition of usefulness. While one stakeholder group may consider the usefulness of handheld computers to be related primarily to the devices’ portability, multiple functionalities, and the storage, access, and transfer of data, the teacher stakeholder group is likely to want to know how handheld computers will help them fulfill their classroom tasks and responsibilities. In addition, teachers want to know if the technology will enhance their overall job performance, as they assess it themselves, and also as assessed by their school administrators (Davis et al., 1989; Ma et al., 2005). Such evidence can be provided by empirical studies, but often has a profound influence when provided via the anecdotes and recommendations of other technology users. Thus, as administrators and policy makers attempt to convince teachers that handheld computers and other electronic technologies are useful in facilitating instruction, they should also consider the value of obtaining recommendations from other teachers familiar with these technologies.

Subjective norm. The term subjective norm refers to a broad category that includes a teacher’s perceptions about, opinions regarding, or suggestions influencing his or her adoption and use of a handheld computer or other technology (Ajzen, 1988; Hu et al., 2003; Ma et al., 2005; Taylor & Todd, 1995). For the most part, as the term suggests, these norms are particular to each user, and are largely subjective, influenced not by empirical information about a technology’s utility, ease of use, or functionality, but by anecdotal accounts of others’ experiences with the technology and one’s perceptions and projections about the technology based on one’s own previous experiences (Marcinkiewicz & Regstad, 1996). The more negative experiences one has had with technology in the past, the more likely one is to be predisposed to resist, reject, or misuse the technology being introduced, even if it has been shown to have compelling benefits for both micro- and macro-level goals (Marcinkiewicz & Regstad, 1996). While subjective norms are available, the user also wants to know that the hardware and software are both dependable and reliable, with minimal intervention required from technical support staff or materials.

Dependability. Dependability refers to a technology’s ability to perform consistently. It is also defined as the system property that integrates [the] attributes [of] reliability, availability, safety, security, survivability, [and] maintainability (Avizienis, Laprie, & Randell, 2001, p. 1). Dependability of both hardware and software is a desirable property of all computer-based systems, whether desktop, laptop, or handheld (Sterritt & Bustard, 2003, p. 247). Dependability and reliability are critical variables that, when taken into consideration, can help users predict the device’s useful lifespan (Fitzgerald, 2002).

Dependability is measured by tabulating the incidents of threats, faults, errors, and failures that prevent the end user from being able to use the technology to fulfill its intended purpose (Avizienis et al., 2001, p. 1). Although dependability has improved considerably as technology has become more sophisticated, it remains a critical variable that determines both a user’s interest in a technology and his or her ability to utilize it consistently, particularly because the same evolutionary process that has improved dependability has simultaneously increased the number of potential threats to dependability (Avizienis et al., 2001). In addition to discussing that teachers are influenced by the others to use handheld computer, and they believe it to be dependable, simple to use and useful for the realization of their own and the school’s goals, it is crucial to elaborate how teachers intend to use handheld computers regarding four factors above.

Perceptions regarding the intention to use handheld computers. A teacher’s decision to use a handheld computer may over time exert less of an influence than it does at present, particularly as both informal and formal elements of American culture demand the integration of technology in the country’s classrooms (Cradler & Cradler, 2002). The No Child Left Behind (NCLB) Act in the beginning of this decade included provisions for the expanding role of technology in American schools (Cradler & Cradler, 2002). The NCLB Act emphasized the importance of technology’s adoption and utilization in special education classrooms, making teachers in this area particularly compelled to address the question of whether and how they would incorporate technology into their classrooms, not only for instruction, but also for observation, monitoring, and evaluation purposes (NCLB, 2002).

As Hu, Chau, Liu, and Tam (1999) pointed out, however, mere adoption of a technology is not necessarily equivalent to a commitment to use the technology, much less to do so consistently and effectively. Teachers have varying beliefs about the value and utility of technology, and its ease of use.
Teachers also have varying levels of confidence in their own ability to master technology for basic and advanced purposes. Therefore, the teacher’s intention and commitment to use a handheld computer or other technological resource in the classroom are dependent on a number of factors. Administrators and policy makers who realize that a conceptual and pragmatic gap often exists between a teacher’s intention to use technology—which, in many cases, is mandated by the district and school—and his or her commitment to use it, will be better able to address these issues. A teacher may intend to use the handheld computer, and may actually do so to comply with administrators’ expectations and demands. Intention and use however, should not be mistaken for indicators or confirmation that the technology is being used appropriately or optimally.

For these reasons, stakeholders responsible for determining the extent to which handheld computers will be implemented in classrooms need to attach some observable outcome criteria and measurements to the use of such technologies. Without making oversight punitive, administrators should ensure that technologies are being used correctly for the appropriate reasons, and that they are being leveraged to support the teacher’s and school’s overall instructional and achievement goals. Otherwise, the technology’s potential benefits may be either undermined or underexploited.

Although the mobile technology has become a widespread in a range of organizational settings and user populations, empirical studies examining key factors affecting user behavior and its acceptance are limited. The TAM has been modified to measure individual’s intention to use mobile wireless technology in several studies (Kim, 2008; Kwon & Chidambaram, 2000; Liang, Xue, & Bryd, 2003; Lu, Liu, Yu, & Yao, 2003; Pedersen, 2005). However, none of these studies were in education. The study reported here was intended to explore the handheld computer acceptance process and the differences between the groups of special education teachers in their educational settings, and to identify key intention determinants for using this technology based on a modified version of the technology acceptance model.

**Method**

**Participants**

Participants included two categories of special education teachers: those involved in a funded research project that investigated how special education teachers spend their time and those not involved. The project teachers came from two districts in a south-central U.S. state \((n = 46)\). Teachers recorded their self-report of time-use data using a two-media (handheld- and Web-based data collection systems) instrument (Vannest, Hagan-Burke, & Parker, 2006) at three different times during 2005-2006. A data collection instrument developed on handheld computer was used for a total of ten weeks in the fall and winter terms \((n = 18)\), and a web-based version of the same instrument was utilized for five weeks in the spring term \((n = 28)\). The project teachers were grouped into three by experience of using these two media for their self-report of time-use data in the fall, winter, and spring terms: only handheld computer experience, only Web experience, and both.

Those in the comparison sample were special education teachers solicited within the same districts not involved or connected with the research project. They were selected based on demographics and their lack of previous experience using any type of data collection system, and was limited to those not already involved in the project \((n = 91)\).

<table>
<thead>
<tr>
<th>(n)</th>
<th>Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>Special education teachers who used only the handheld-based data collection system for self-report of their time-use.</td>
</tr>
<tr>
<td>8</td>
<td>Special education teachers who used both Web- and handheld-based data collection systems for self-report of their time-use.</td>
</tr>
<tr>
<td>12</td>
<td>Special education teachers who used only the Web-based version of the handheld data collection system for self-report of their time-use.</td>
</tr>
<tr>
<td>17</td>
<td>Special education teachers who did not involve in the project.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>(n)</th>
<th>Participants</th>
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</thead>
<tbody>
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<td>8</td>
<td>Special education teachers who used only the handheld-based data collection system for self-report of their time-use.</td>
</tr>
<tr>
<td>8</td>
<td>Special education teachers who used both Web- and handheld-based data collection systems for self-report of their time-use.</td>
</tr>
<tr>
<td>12</td>
<td>Special education teachers who used only the Web-based version of the handheld data collection system for self-report of their time-use.</td>
</tr>
<tr>
<td>17</td>
<td>Special education teachers who did not involve in the project.</td>
</tr>
</tbody>
</table>

Forty-five special education teachers were included in the current study (see Table 1) to test the acceptance of handheld computers. Gender distribution showed an approximate 15:1 ratio in favor of female teachers. Their ages ranged from 22 to 31 (24.4%), from 32 to 41 (31.2%), from 42 to 51 (24.4%), and over 51 (20%). More than half of the participants (55.6%) owned a handheld computer.
They also reported they have used basic functions such as calendar, address book, to-do list, and notepad on handheld computers more often than other functions.

**Model**

As shown in Figure 1, the Technology Acceptance Model (TAM) was used as a theoretical basis, with its modified version (Hu et al., 2003; Ma et al., 2005) used in this study. In addition, a dependability construct was added to the model as a direct predictor of behavioral intention, ease of use, and usefulness. This was because teachers who experience difficulties regarding the dependability and reliability of their handheld computers are more likely than other users to use the device less frequently, to use it incorrectly, or even to abandon its use altogether (Edyburn, 2001). Teacher acceptance of handheld computers was measured using behavioral intention, which is theoretically and empirically supported in the TAM literature. Based on this expanded model, a teacher’s intention to use handheld computer technology could be predicted and explained by his or her subjective perception of the technology’s usefulness, ease of use, and dependability in conjunction with his or her subjective norm.

Perceived usefulness was defined in this study as a teacher’s subjective probability that using [handheld computer technology would] increase his or her job performance within [the school] context (Davis et al., 1989, p. 985), while perceived ease of use was defined as the degree to which [a teacher expected handheld computer technology] to be free of effort (p. 985). Subjective norm refers to a teacher’s perceptions about, opinions regarding, or suggestions influencing his or her adoption and use of handheld computer technology (Ajzen, 1988).

**Instrumentation**

One instrument—a modified version of the original TAM instrument—was used in this study. The handheld computer acceptability survey (HCAS) (Hu et al., 2003; Ma et al., 2005; Venkatesh & Davis, 2000) includes questions dealing with teachers’ demographics, experiences with handheld computers, and finally, the acceptability items (see Appendix). The central construct of acceptability is composed of sub-constructs. The HCAS was developed based on five sub-constructs regarding the handheld computer: dependability (D), usefulness (PU), ease of use (PEU), teachers’ intention to use (IU), and subjective norm (SN). TAM is a well-researched instrument with historical precedent in the validity and reliability of scores obtained from previous administrations. The instrument was designed for and used with a similar population, thereby increasing its content validity (Ma et al., 2005; Smarkola, 2007; Teo, 2009). HCAS includes items adapted from several variations of the TAM that were tailored to this study on handheld computer use in an education context. A total of 23 items were included within five domains of HCAS: intention to use (2 items), perceived usefulness (6 items), perceived ease of use (10 items), subjective norm (2 items), and dependability (3 items).
All HCAS items were randomly arranged based on a Likert-type five-point scale scored using the following key: 5 = strongly agree, 4 = agree, 3 = neutral, 2 = disagree, and 1 = strongly disagree. HCAS also included a demographic section that asked participants to state their sex, age, experience using handheld computers, and frequency of handheld computer use for daily tasks (such as word processing, Internet access, and e-mail).

Data Collection and Analysis

To measure participants’ acceptance of handheld computers, data were gathered from HCAS responses. The online version was administered to four different groups of special education teachers in mid-spring 2008. All participants (N = 137) were sent an e-mail that included a secure link and password to HCAS. A participation incentive was provided. Two respondents were randomly selected to win $50 gift certificates to Amazon.com. Forty-five (33%) completed surveys were collected with an assurance of confidentiality. The analyses used included linear regression, path analysis using structural equation modeling, and multivariate analysis of covariance (MANCOVA).

Model fit test. A five-variable path model was developed to examine causal relationships between three observed (measured) endogenous variables (PU, PEU, and IU) and two observed exogenous variables (D and SN). The AMOS 6.0 software (Arbuckle, 2005) with unweighted least squares (ULS) estimation was used to fit the path model in Figure 1 to the HCAS data. ULS was used given the small number of cases, as it provides reasonable estimators for small sample datasets. While we expected that power to detect effects was low, power was above 80% to detect a path value above about 0.3, a moderate effect that would indicate a meaningful direct effect between two variables. The model’s overall fit with the HCAS data was evaluated using fit indexes different from Chi-square statistics, which provide only approximate indication of fit as they are very sensitive to sample size (N = 45) (Kline, 2005). The goodness-of-fit index (GFI), the adjusted goodness-of-fit index (AGFI), and Bentler-Bonett normed fit index (NFI) were considered to test the model fit (Hair, Black, Babin, Anderson, & Tatham, 2006; Hoyle, 1995). Each causal path was evaluated in terms of statistical significance (t statistics, p = .05) and strength using standardized path coefficient (standardized betas) that range from -1 to +1. In addition, $R^2$ was used as an indicator of the model’s overall predictive strength.

Group differences. Due to the nature of the data collected (survey data using Likert-scale items on five constructs measuring teacher acceptance of handheld computers), non-parametric inferential and descriptive statistics were also calculated on the scores of the dependent measures. To test differences among the groups of special education teachers based on their predetermined handheld computer experience, a non-parametric MANCOVA (Hair et al., 2006) with several planned contrasts was employed using SPSS 15.0 software. The five constructs of the HCAS served as dependent variables. Participants’ ages and genders were entered as covariates to avoid bias due to project selection effects.

Results

Data from the HCAS instruments were analyzed to test the differences of four participant groups on five constructs (dependent variables) and the relations among observed and latent variables (constructs). With the exception of two items, the descriptive statistics of the HCAS items shown in Table 2 indicated that participants held generally positive (mean scores greater than three) perceptions towards handheld computer use in their classrooms. The mean scores ranged from 2.11 to 4.13, while the standard deviations ranged from 0.73 to 1.07. The internal consistency of the HCAS instrument was calculated using Cronbach’s $\alpha$-value. As shown in Table 2, Perceived Ease of Use, Perceived Usefulness, and Intention to Use exhibited $\alpha$-values greater than 0.70, and Subjective Norm had a value of 0.62 while Dependability had a value of 0.31. However, item D3 was deleted and not included in the prospective analyses regarding item-total statistics results, which increased $\alpha$-value for Dependability to 0.79.

Model Fit Testing

Because the study’s sample size was small (N = 45) and the chi-square test of absolute model fit is sensitive to sample size and non-normality in the underlying distribution of the input variables, unweighted least squares estimates and the other common fit indexes—GFI, AGFI and NFI—were considered in AMOS to analyze the survey data and to evaluate the model’s overall fit (D’Agostino & Stephens, 1986; Schumacker & Lomax, 2004). The most common index of fit, GFI = 0.992 (> .90) (Kline, 2005), AGFI = .939 (> .80) (Segars & Grover, 1993), and NFI = .974 (> .90) (Chin & Todd, 1995) exhibited an acceptable fit to the data based on the common acceptable values in the parentheses, which meant the overall model resulted in a very good fit.
Table 2. Summary of Descriptive Statistics and Reliability of HCAS Instrument

<table>
<thead>
<tr>
<th>HCAS Items</th>
<th>N</th>
<th>Mean</th>
<th>SD</th>
<th>Cronbach’s α</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intention to Use (IU)</td>
<td>45</td>
<td>4.13</td>
<td>4.726</td>
<td>.73</td>
</tr>
<tr>
<td>IU1</td>
<td>45</td>
<td>4.04</td>
<td>.976</td>
<td></td>
</tr>
<tr>
<td>IU2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perceived Usefulness (PU)</td>
<td></td>
<td></td>
<td></td>
<td>.86</td>
</tr>
<tr>
<td>PU1</td>
<td>45</td>
<td>3.87</td>
<td>.894</td>
<td></td>
</tr>
<tr>
<td>PU2</td>
<td>45</td>
<td>3.58</td>
<td>.753</td>
<td></td>
</tr>
<tr>
<td>PU3</td>
<td>45</td>
<td>3.78</td>
<td>.902</td>
<td></td>
</tr>
<tr>
<td>PU4</td>
<td>45</td>
<td>3.87</td>
<td>.894</td>
<td></td>
</tr>
<tr>
<td>PU5</td>
<td>45</td>
<td>3.58</td>
<td>.965</td>
<td></td>
</tr>
<tr>
<td>PU6</td>
<td>45</td>
<td>3.69</td>
<td>.793</td>
<td></td>
</tr>
<tr>
<td>Perceived Ease of Use (PEU)</td>
<td></td>
<td></td>
<td></td>
<td>.92</td>
</tr>
<tr>
<td>PEU1</td>
<td>45</td>
<td>3.09</td>
<td>.733</td>
<td></td>
</tr>
<tr>
<td>PEU2</td>
<td>45</td>
<td>3.16</td>
<td>.999</td>
<td></td>
</tr>
<tr>
<td>PEU3</td>
<td>45</td>
<td>3.38</td>
<td>.960</td>
<td></td>
</tr>
<tr>
<td>PEU4</td>
<td>45</td>
<td>3.00</td>
<td>.905</td>
<td></td>
</tr>
<tr>
<td>PEU5</td>
<td>45</td>
<td>3.67</td>
<td>.953</td>
<td></td>
</tr>
<tr>
<td>PEU6</td>
<td>45</td>
<td>3.53</td>
<td>1.057</td>
<td></td>
</tr>
<tr>
<td>PEU7</td>
<td>45</td>
<td>3.33</td>
<td>1.022</td>
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<td>PEU8</td>
<td>45</td>
<td>3.51</td>
<td>.757</td>
<td></td>
</tr>
<tr>
<td>PEU9</td>
<td>45</td>
<td>3.51</td>
<td>.815</td>
<td></td>
</tr>
<tr>
<td>PEU10</td>
<td>45</td>
<td>3.62</td>
<td>.936</td>
<td></td>
</tr>
<tr>
<td>Subjective Norm (SN)</td>
<td></td>
<td></td>
<td></td>
<td>.62</td>
</tr>
<tr>
<td>SN1</td>
<td>45</td>
<td>2.84</td>
<td>.999</td>
<td></td>
</tr>
<tr>
<td>SN2</td>
<td>45</td>
<td>3.02</td>
<td>1.011</td>
<td></td>
</tr>
<tr>
<td>Dependability (D)</td>
<td></td>
<td></td>
<td></td>
<td>.31</td>
</tr>
<tr>
<td>D1</td>
<td>45</td>
<td>3.38</td>
<td>.834</td>
<td></td>
</tr>
<tr>
<td>D2</td>
<td>45</td>
<td>3.80</td>
<td>.815</td>
<td></td>
</tr>
<tr>
<td>D3</td>
<td>45</td>
<td>2.11</td>
<td>1.071</td>
<td></td>
</tr>
</tbody>
</table>

Figure 2 shows the resulting path coefficients of the overall model. For the overall model, most of the standardized path coefficient represented a statistically significant relationship between the variables. Perceived usefulness and perceived ease of use had a statistically significant direct effect on participants’ intention to use handheld computers, with standard path coefficients of .49 (p < .01) and .42 (p < .05), respectively.
In other words, intention to use handheld computers would positively improve by 0.49 standard deviations, given a change in perceived usefulness of one full standard deviation, when the other variables in the model were controlled. Direct effect of perceived ease of use on perceived usefulness was 0.56, statistically significant ($p < .01$). Dependability had the strongest and statistically significant effect in the model, which was on perceived ease of use, with a standardized path coefficient 0.58 ($p < .001$). Although dependability had a statistically non-significant direct effect on intention to use handheld computers, its total effect on intention to handheld computer use, through the mediating perceived usefulness and perceived ease of use, was a statistically significant and 0.44. Subjective norm had neither a statistically significant direct nor indirect effect on perceived usefulness or intention to handheld computer use.

The proportions of explained variance across dependent variables—perceived ease of use, perceived usefulness, and intention to use handheld computers—ranged from 34% ($p < .01$) to 59% ($p < .001$). Overall, the model accounted for a statistically significant portion of variance (57%, $p < .001$) in participants’ acceptance of handheld computers. Perceived ease of use was predicted by the direct effect of dependability resulting in an $R^2$ of .34 ($p < .01$), while perceived ease of use, dependability and subjective norm together explained 62% of the variance in perceived usefulness (see Table 3). Based on the results from the model, perceived usefulness was the most important determinant of intention to use handheld computers, followed by ease of use, then dependability.

<table>
<thead>
<tr>
<th>Causal Path</th>
<th>Standardized Path Coefficients</th>
<th>Standard Errors</th>
</tr>
</thead>
<tbody>
<tr>
<td>D → PEU</td>
<td>.580 ***</td>
<td>.575</td>
</tr>
<tr>
<td>D → PU</td>
<td>.290 *</td>
<td>.320</td>
</tr>
<tr>
<td>SN → PU</td>
<td>.062</td>
<td>.241</td>
</tr>
<tr>
<td>PEU → PU</td>
<td>.562 ***</td>
<td>.073</td>
</tr>
<tr>
<td>PEU → IU</td>
<td>.416 *</td>
<td>.036</td>
</tr>
<tr>
<td>D → IU</td>
<td>-.079</td>
<td>.140</td>
</tr>
<tr>
<td>SN → IU</td>
<td>-.192</td>
<td>.099</td>
</tr>
<tr>
<td>PU → IU</td>
<td>.486 **</td>
<td>.064</td>
</tr>
</tbody>
</table>

Note. $R^2_{IU} = .57$ ***, $R^2_{PU} = .62$ ***, $R^2_{PE} = .34$ ***.

**Group Differences Results**

A MANCOVA was performed contrasting the four groups listed in Table 1 on all five dependent variables. Levene’s Test of Homogeneity of Variance and Box’s M Test of Homogeneity of Covariance revealed no violation of assumptions. Bartlett’s test was not considered because it is sensitive to even minor departures from normality or heteroscedasticity. Age and gender were tested separately within the overall MANCOVA to examine their relative contribution to any observed effects on the dependent variables.

Neither age ($F (5, 35) = 1.514, p > .05$) nor gender ($F (5, 35) = .755, p > .05$) accounted for a statistically significant proportion of the variance; therefore, they were not considered as covariates in the model. The overall group factor was statistically significant in the multivariate analysis ($F (15, 102) = 1.809, p < .05$), but examination of univariate ANOVAs yielded only one statistically significant dependent measure, subjective norm, among the four group levels (see Table 4). Certainly, power was not great to detect the small effects that were estimated here.

| Table 4. Univariate Analysis Results for Group on Dependent Measures |
|---------------------------------|--------------------|---------|---------|
| Dependent Measures              | MS                 | $F(3, 41)$ | $\eta^2$ | Power |
| Intention to Use                | .801               | .328    | .023    | .108  |
| Perceived Usefulness            | 14.832             | .908    | .062    | .231  |
| Perceived Ease of Use           | 16.450             | .327    | .023    | .108  |
| Subjective Norm                 | 7.660              | 2.957*  | .178    | .658  |
| Dependability                   | .956               | .288    | .021    | .100  |

*p < .05.
A summary of all planned contrasts is presented in Table 5. Of the eight planned contrasts within the MANOVA, only three—C1, C2, and C7—demonstrated statistically significant results, and these were on the same dependent measure of subjective norm. Specifically, contrasting group 1 against group 2 (C1) yielded that participants who used handheld- and Web-based data collection technology considered opinions or suggestions of others concerning their acceptance of handheld computers more than the ones who used only handheld computers \( (p < .01) \). A comparison of group 1 and group 3 (C2) revealed that participants who used only Web-based data collection technology cared more about the opinions or suggestions of others concerning their acceptance of handheld computers than those who used only a handheld-based version \( (p < .05) \). Contrasting group 1 with groups 2 and 3 (C7) showed that participants who used handheld- and Web-based data collection technology, and those who used only Web-based data collection technology, took into greater consideration the opinions or suggestions of others concerning their acceptance of handheld computer than those who used only a handheld-based version \( (p < .01) \). Based on participants’ responses, the multivariate statistics with several contrasts demonstrated that four groups of participants differed only on subjective norm. Difference of the groups on the rest of the dependent measures was not statistically significant.

### Table 5. Contrasts of Group Means by Hypothesis

<table>
<thead>
<tr>
<th>Contrasts</th>
<th>IU</th>
<th>PU</th>
<th>PEU</th>
<th>SN</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>( F )</td>
<td>( CD )</td>
<td>( F )</td>
<td>( CD )</td>
<td>( F )</td>
</tr>
<tr>
<td>C1 (1,1,0,0)</td>
<td>.64</td>
<td>.63</td>
<td>.86</td>
<td>1.88</td>
<td>.10</td>
</tr>
<tr>
<td>C2 (1,0,1)</td>
<td>.22</td>
<td>.33</td>
<td>.29</td>
<td>1.00</td>
<td>.40</td>
</tr>
<tr>
<td>C3 (1,0,0,1)</td>
<td>.81</td>
<td>.60</td>
<td>.10</td>
<td>.56</td>
<td>.88</td>
</tr>
<tr>
<td>C4 (1,1,1,1)</td>
<td>.10</td>
<td>.31</td>
<td>1.84</td>
<td>3.43</td>
<td>.72</td>
</tr>
<tr>
<td>C5 (1,1,1,0)</td>
<td>.00</td>
<td>.04</td>
<td>1.58</td>
<td>3.88</td>
<td>.30</td>
</tr>
<tr>
<td>C6 (1,1,1,1)</td>
<td>.34</td>
<td>.85</td>
<td>.26</td>
<td>2.55</td>
<td>.67</td>
</tr>
<tr>
<td>C7 (2,1,1,0)</td>
<td>.53</td>
<td>.96</td>
<td>.07</td>
<td>.88</td>
<td>.28</td>
</tr>
</tbody>
</table>

*Note. Simple contrasts were used. \( CD = \) Contrast Difference.

\* \( p < .05 \), \** \( p < .01 \).

### Discussion

This study was conducted to: (1) investigate special education teachers’ acceptance of handheld computers, (2) determine the key factors that influence special education teachers’ intention to use handheld computers, and (3) test the differences between groups of participants who had varying levels of handheld computer use on five constructs: IU, PU, PEU, SN, and D. The model structured with these constructs, consistent with the Technology Acceptance Model (TAM) literature, including the new dependability construct, was also tested. It was found that the special education teachers’ overall average scores for each construct were all positive. Perceived usefulness and perceived ease of use were two direct determinants of special education teachers’ intention to use handheld computers. Dependability was statistically confirmed to be an essential contributor for special education teachers’ intention to use handheld computers, through perceived usefulness and perceived ease of use. Subjective norm was the only construct on which the four groups of special education teachers differed significantly.

Perceived usefulness was one of the most significant factors in determining the special education teachers’ acceptance of handheld computers, a finding similar to previous studies such as those by Legris et al. (2003), Liang et al. (2003), Lu et al. (2003), and Ma et al. (2005). Accordingly, special education teachers perceive that handheld computers are useful because such computers improve their instructional performance, productivity and effectiveness. The usefulness of technology was also associated with its ease of use and dependability in the study either directly or indirectly. Therefore, having handheld computers that are not easy to use and dependable may cause special education teachers to perceive such computers in general as not useful. Special education teachers also considered handheld computers as useful regardless of the others’ positive suggestions and opinions.

Perceived ease of use had both significant direct (Liang et al., 2003; Lu et al., 2003) and indirect effects on handheld computer acceptance, as mediated by perceived usefulness, just as Yuen and Ma (2002) found. In other words, special education teachers would adopt handheld computers when they are confident that using such computers would not require substantial investments of time, energy, or effort to learn and to maximize functional capabilities. A significant indirect effect of perceived ease of use on intention to use handheld computers (through perceived usefulness) also indicates that special education teachers’ acceptance of handheld computers can be stronger and significant if they perceive handheld
computers as easy to use and perceive that their use will benefit their teaching, classroom management, and student outcomes.

It was found that the average scores of subjective norm were low when compared with the other constructs. The model test results also showed that the effect of subjective norm on perceived usefulness and intention to use was not statistically significant. From a practical standpoint, special education teachers might not consider their colleagues’ opinions or suggestions when making their initial decision to accept or reject the use of a handheld computer. This result is consistent with some previous studies (e.g., Davis, 1986; Ma et al., 2005), even though other studies (e.g., Ajzen, 1988; Mathieson, 1991; Pedersen, 2005; Taylor & Todd, 1995; Venkatesh & Davis, 2000) found either direct or indirect significance for these relationships. One reason for this discrepancy could be that the special education teachers in this study decided independently to accept handheld technology. On the other hand, more than half of the special education teachers in the study were required to use the handheld computers provided by the funded project. This argument was not consistent with the research study (Venkatesh & Davis, 2000) that found significant effect on intention to use in a mandatory-use context. Furthermore, the direct effect of subjective norm on intention to use handheld computers was adverse. The reason for this might be associated with special education teachers’ own perspectives for accepting or rejecting handheld computers before they were informed of their colleagues’ opinions.

The groups of special education teachers were significantly separated on only a subjective norm. A primary reason for this significant difference was the scores of the first group of special education teachers, who used only handheld computers in the funded research study. This difference resulted from the fact that these special education teachers did not need any norms from the other subjects as they become confident and experienced using handheld computers. Similarly, Hu et al. (2003) found that the effect of subjective norm on technology acceptance was not supported at the end of the training session, though this effect was supported at the beginning of the session. Therefore, this study contributes to the findings in the technology acceptance literature that one who has experience using this technology may resist the norms provided by other subjects.

This study is unique because it added dependability as a new construct. The overall average scores of dependability were greater than three, meaning that special education teachers found handheld computers dependable for use in their school settings. The model test results showed that the direct effect of dependability on intention to use handheld computers was not supported. However, dependability had a statistically significant direct effect on perceived ease of use and perceived usefulness. One interpretation of this finding could be that as long as the handheld computer hardware and software are both dependable and reliable with minimal technical support, special education teachers consistently perceive handheld computers as easy to use and useful for school-based tasks (Avizienis et al., 2001). In addition to direct effect, the indirect effect of dependability through the mediated effects of perceived usefulness and ease of use on intention to use handheld computers was also significant. This result is also plausible given that the dependability of handheld computers might not directly explain their acceptance by special education teachers who do not know that these computers are easy to use and useful. However, having dependable and useful, or dependable and easily used, technology makes a difference in special education teachers’ acceptance of handheld computers.

Regarding the contrast results, all constructs except subjective norm did not differentiate the groups of special education teachers. One reason is associated with participants’ differing levels of use and experience with handheld computers. Even if the 19 special education teachers experienced handheld computers in the funded project, there were still six more teachers who were not associated with the project and also used or owned handheld computers. It might be said that although the average scores of these 19 teachers showed positive intention to use handheld computers, this positivity was not sufficient to obtain significance among groups based on handheld computer experience. Another possible reason is that special education teachers in all four groups from the onset might have been disposed to be open to new technology and believe that technology is an indispensably assistive tool for their daily tasks.

There are several factors limiting this study. First, the sampling and assignment were not random, that is cluster sampling was used and only special education teachers were included. Second, the sample size of the study was small for testing the model and group differences. Small samples are generally underpowered and there is greater potential to erroneously fail to reject the null hypothesis and obtained results for small samples are less stable (Chou & Bentler, 1995; Kline, 2005). Thus, sampling and sample
size must be considered a prerequisite factor when generalizing these findings. In this case, testing the model with a larger number of both special education and general education teachers might give more stable results that could be generalized to a greater segment of the teaching field.

Third, the special education teachers in this study worked in different organizational contexts. Some were required to use handheld computers in the funded project in which they were involved. This participation brings the issue of context (Legris et al., 2003) into discussion and requires further research to test the models in mandatory and voluntary settings to bring different perspectives to the acceptance research. Fourth, the dependability factor on technology acceptance was tested and supported only with regard to handheld computers. The value of dependability should also be tested with other technologies to contribute a new model with several variations to the field. Finally, having lower reliability for dependability constructs when compared with satisfactory values may be a potential limitation, though this was improved by deleting the problematic item in the study. Therefore, caution should be taken regarding the reliability of each item in the instrument before conducting the main study. Specifically, having more than three items, as well as having alternately presented or negatively worded items, may alleviate the need for these caveats in further research (cf. Selwyn, 1997).

Implications and Conclusions

Although technology is evolving rapidly and has become increasingly common and accepted in school settings, just as it has in society at large, McDonald (2002) pointed out that studies of score equivalence have largely ignored individual differences such as computer experience, computer anxiety and computer attitudes, all of which have been substantiated by the literature as potential obstacles inhibiting the adoption and application of handheld computers (p. 299). Although teachers may rightly be viewed as likely to be open to learning new skills, technology adoption is a complicated area of learning, the success of which is often influenced by existing beliefs and perceptions. Those responsible for implementing and overseeing handheld computer use may not be able to effectively manage the wide range of beliefs and perceptions pertaining to technology, but knowing that they exist could be a minimum expectation.

The findings of the study support the influence of dependability on perceived ease of use and perceived usefulness as an asset that accelerates the process through which teachers come to accept handheld computers. Accordingly, it is crucial that school administrators and policy makers regularly check with teachers to ensure that they are not experiencing difficulties vis-à-vis dependability and reliability, in addition to ensuring that teachers are trained to use the computer appropriately, that they are satisfied with its performance, and that they believe it to be both simple to use and meaningful for the realization of their own and the school’s goals (Edyburn, 2001).

While developing awareness and providing training for the introduction of handheld computers in the classroom are important strategies to prepare teachers for optimal leveraging of technology (Schulenberg & Yutrzenka, 2004), teachers are by no means the only, or even the most important, variables. The five areas discussed in this study must all be addressed to successfully and dependably prepare, plan, and implement the use of handheld computers into school- and classroom-based settings.

Overall, the study tested the model to explain the handheld technology acceptance decision process and the differences between the groups of special education teachers on five constructs of this model. Testing found that all the causal relationships among the constructs’ latent variables (except the ones directed from subjective norm) were statistically significant; namely, special education teachers’ intention to use handheld computers was successfully explained by their perceptions on the handheld computers’ ease of use, usefulness, and dependability. Subjective norm was only factor for which the groups of special education teachers differed.

These findings are clearly an important addition to the literature pertaining to technology adoption in educational settings. A new tested dependability factor, blended with the factor of computer experience, will provide a new asset for technology acceptance models to be tested in diverse international contexts and with different technology applications.

References


Appendix. Handheld Computers Acceptability Survey

Part I:
Directions: Please answer the following questions by putting a check mark with the appropriate response or filling in the information requested.
1. Gender ___ Male ___ Female
2. Age: _____
3. Have you owned or had access to a handheld computer? ___ Yes ___ No
4. I have been using handheld computers for _____ years.
5. During the last year, how often have you used a handheld computer for the following tasks (Check one answer per task)?

<table>
<thead>
<tr>
<th>Task</th>
<th>Never</th>
<th>Once or Twice</th>
<th>Monthly</th>
<th>Weekly</th>
<th>Daily</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basic functions such as calendar, address book, to do list, and note pad</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Word processing</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Multimedia presentations</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spreadsheet or database</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Drawing</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Internet access</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Email</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Games</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Playing music</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Taking pictures</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stand-alone application to assist your activities</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
**Part II:**

<p>| | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>I intend to use handheld computers when they become available in my school settings. (IU)</td>
<td>Strongly Disagree</td>
<td>Disagree</td>
<td>Neutral</td>
</tr>
<tr>
<td>2.</td>
<td>To the extent possible, I would use handheld computers to do various Special Education tasks. (IU)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>Using handheld computers improves Special Education teachers’ school performance. (PU)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>Handheld computers enable Special Education teachers to accomplish tasks more quickly. (PU)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>Using handheld computers will make it easier for Special Education teachers to perform their daily activities. (PU)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td>Using handheld computers enhance Special Education teachers’ effectiveness on Special Education services. (PU)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td>I find handheld computers to be useful for Special Education teachers. (PU)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td>The quality of the output from handheld computers is high. (PU)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9.</td>
<td>Frequent errors are not common when using handheld computers. (PE)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10.</td>
<td>I rarely need help when using handheld computers. (PE)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11.</td>
<td>It is easy to get handheld computers to do what I need them to do. (PE)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12.</td>
<td>It is easy to become skillful in using handheld computers. (PE)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13.</td>
<td>Learning to operate handheld computers is easy. (PE)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14.</td>
<td>Interactions with handheld computers are clear and understandable. (PE)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15.</td>
<td>Interacting with handheld computers does not require a lot of mental effort. (PE)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16.</td>
<td>Handheld computers are easy to use. (PE)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17.</td>
<td>I rarely become confused when using handheld computers. (PE)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18.</td>
<td>The results of using handheld computers are apparent. (PE)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>19.</td>
<td>People who influence my behavior think that I should use handheld computers. (SN)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20.</td>
<td>People who are important to me think that I should use handheld computers in my instruction. (SN)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>21.</td>
<td>Handheld computers are reliable and trouble free for data collection. (D)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>22.</td>
<td>Handheld computers are dependable computers for data collection. (D)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>23.</td>
<td>Handheld computers are available for Special Education teachers to use for data collection any time. (D)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(PE) = Perceived Ease of Use; (PU) = Perceived Usefulness; (IU) = Intention to Use; (SN) = Subjective Norm; (D) = Dependability
ATTENTION-DEFICIT AND HYPERACTIVITY AMONG SCHOOL-AGE UNITED ARAB EMIRATES CHILDREN

Vivian Khamis
American University of Beirut

The prevalence of ADHD was studied among 200 UAE school-age children. Variables that distinguish ADHD and non-ADHD children were examined, including child characteristics, parents’ sociodemographics, socioeconomic status, family environment, and parental style of influence. Results indicated that 12.5% of the children had ADHD symptomatology, and that the prevalence ratio varied across the three ADHD subtypes, with the following rates: 1.5% for the combined type, 7.5% for the inattentive type, and 3.5% for the hyperactive-impulsive type. The results of the logistic regressions indicated that ADHD inattentive type was positively associated with gender, and harsh discipline. Children with ADHD inattentive type were predominately males and were more likely to experience harsh disciplining compared to children without ADHD. On the other hand, none of the child characteristics, parent’s sociodemographics, family environment and parenting were significant predictors of ADHD hyperactivity-impulsivity type. The clinical and policy implications of the findings are discussed.

Attention deficit/hyperactivity disorder (AD/HD) is characterized by developmentally maladaptive and inconsistent levels of inattention, impulsivity, and hyperactivity (DSM-IV; American Psychiatric Association, 1994; Barkley 1998; Faraone & Biederman 1994; Gaub & Carlson, 1997). Although the American Psychiatric Association (APA 1994), indicates that about 3 to 5 percent of the school-age population have ADD or ADHD, with boys greatly outnumbering girls, other studies reveal higher prevalence rates of ADHD (Canino et al. 2004; Khamis, 2006; Lesesne et al. 2003).

The underlying aetiological explanations of ADHD varied from biological to environmental (Daley, 2006). The biological explanations include genetics (Stevenson et al., 2005; Thapar et al. 1999), brain structure (Castellanos & Acosta 2002; Semrud-Clikeman et al., 2000), brain injury or dysfunction (Riccio, Hynd, Cohen, & Gonzalez, 1999), and neuropsychological (Nigg 2001; Schachar et al., 2000) while the environmental include parenting and diet. In addition, various psychological causes have been suggested, ranging from psychoanalytic explanations to those involving social learning theory. For instance, studies of modeling and imitation illustrate how children could acquire deviant behavior patterns through observation of frenetically active parents or siblings. The literature is replete with examples of how children’s inappropriate behavior can be manipulated by social attention, suggesting that parents and teachers could inadvertently teach youngsters to behave in the manner that characterizes ADHD (Barkley, 1998; Hallahan & Cottone., 1997; Hinshaw, 1994; Kauffman, 2005). Although the causes of ADHD are still under investigation, leading researchers suggest that poorly understood neurological factors instigate the problem, which is then exacerbated by a variety of factors in the physical and social environment (Hallahan & Cottone., 1997; Kauffman, 2005). However research does not clearly and reliably point to any specific biological or environmental cause and genetic factors (Hallahan & Cottone., 1997; Kauffman, 2005; Lerner, Lowenthal, & Lerner, 1995; Riccio et al., 1993).

The problem with ADHD is not one that can be addressed in isolation; the cultural foundations shaping the construction of the disorder must be understood. Researchers have emphasized the need for ADHD theorists and practitioners to reexamine the role of culture in the entire spectrum of ADHD activities, intervention, and treatment (Ideus, 1995). In a recent review of literature, Daley (2005) has shown the environmental influences on attention deficit hyperactivity disorder. The best evidence for environmental
influences on ADHD come from intervention studies which have demonstrated improvements in ADHD symptoms, when parents have been taught alternative parenting skills (Sonuga-Barke et al., 2001; Bor et al., 2002). Studies have indicated that children who have a genetic predisposition will express the disorder when put in the correct environment, typically one characterized by chaotic parenting (Johnston & Mash, 2001; Larsson et al., 2004). More specifically, Hinshaw (1994) has indicated that the family system could not be overlooked in the evaluation of ADHD. Buhrmester and colleagues (1992) investigate both mother–son and father–son interactions and found that parents of ADHD boys were more demanding, aversive and power assertive, while the findings of Gardner (1994) have demonstrated that mothers of ADHD children have been found to be more negative, controlling, intrusive and disapproving, and less rewarding and responsive than mothers of non-ADHD children. Research has shown that high levels of stress, a lowered sense of parenting competence, and discordant parent-child interactions are salient features accompanying ADHD (Anastopoulos, Guermonpt, Shelton, & DuPaul, 1992; Anderson, Hinshaw & Simmel, 1994; Mash & Johnston, 1990). While such features are rarely considered as primary causes of ADHD behavior, stressful, discordant interactions may well predict the maintenance of symptomatology and even the eventual course of the disorder (Anderson et al., 1994; Campbell, March, Pierce, Ewing, & Szumowski, 1991; Hinshaw, 1994). Specifically, the degree of maternal harshness and coercion in parent-child interactions predicted concurrent or subsequent noncompliance, hyperactivity, and antisocial behavior in children.

Research in the Arab world (Khamis, 2006) has recently indicated that family environment and parental style of influence may be a key cause of ADHD, however combining ADHD subcategories into an omnibus cluster of children with ADHD may result in a loss of crucial information. Considerable evidence supports the partial independence of ADHD–related symptomatology and comorbid aggression and anxiety disorders. Without assessments that can yield information on additional features or possible subtypes, we may misattribute risk factors, underlying etiologic mechanisms, follow-up status, or treatment response patterns to ADHD, when these features more accurately pertain to other dimensions or disorders (Hinshaw, 1994).

Despite the growing scientific research of the environmental influences on attention deficit hyperactivity disorder in Western societies, there is limited information that can provide insight into the prevalence, and correlates of ADHD among Arab children and in particular the UAE school-age children (Bu Haroon, Eapen, & Bener, 1999; Khamis, 2006). In fact, the problems of students with ADHD in the UAE public school system are usually more evident in the classroom, where compliance and focused attention to task are essential for success and school performance. The further study of the interplay of culture-specific risk factors and ADHD in school-age UAE children will help clinician and teachers in identification, prevention, and intervention. Consequently, the purpose of this research, is to investigate the prevalence and correlates of ADHD among UAE school-age children. Initial attention will be given to variables that distinguish ADHD children and non-ADHD children, such as child characteristics, parents’ sociodemographics, socioeconomic status, family environment, and parental style of influence.

Method
Participants
The sample size was 200 school age children, of whom 100 (50%) were males and 100 (50%) females. They ranged in age from 11 to 14 years ($M = 12.36$, $SD = .86$). All were from governmental schools, representing various United Arab Emirates; 60 (30%) from Sharjah, 93 (46.5%) from Abu Dhabi, 40 (20%) from Fujairah and 7 (3.5%) from Umm Al-Qwain. One hundred and sixty four (82%) of the children surveyed lived in two-parent homes. Of the children in this study, 59 (29.5%) had learning problems predominantly in Arabic language and Math. For the entire sample, the mean level of education for mothers and fathers was elementary, with the range extending from illiteracy to some university study. The combined monthly income of the participant’s families ranged from 3000 to 22000 UAE Dirham ($M = 12005$, $SD = 5054$). Sample Selection
The design for sample selection was based on three primary stratified variables: gender, age of the child, and various Emirates (i.e. Abu Dhabi, Dubai etc). Data from the Ministry of Education and Youth (MOEY) was used to allocate public schools in the various United Arab Emirates. Children then were selected randomly from each school with the help of school personnel and these students were asked for an interview.
Procedure
Informed consent was obtained from the Ministry of Education, school directors and the participants. They were given a full explanation of the study, assured of the anonymity of their responses, and were ensured confidentiality of all information collected. Three female special education graduates who were trained by the author carried out the interviews with the student and teacher at school.

Instrumentation
Child and Family Data Sheet
A brief questionnaire was developed by the author to secure demographic and background information about the child and the family from mothers and fathers. The child variables considered for this study were age, gender, and school average. The families’ sociodemographics were level of education completed by parents, marital status, employment, family size, and total household income.

Diagnostic Status
The diagnosis for Attention–Deficit Hyperactivity Disorder (ADHD) was based on strict DSM-IV criteria for ADHD (DSM-IV; American Psychiatric Association, 1994). The diagnostic information about the children was obtained through structured interviews with teachers. The interviews included all symptoms related to ADHD. Each item scored yes if the symptom was endorsed as definitely present or no if the respondent indicated either sometimes, rarely, or never.

Family Ambiance Scale (FAS)
The Family Ambiance Scale (Khamis, 2000) was used to assess child’s experience of anxiety in proximal home environment. Items reflected subjective anxiety (tension, nervousness) or its opposite (relaxation, calm) in situations involving various family patterns of interaction such as speaking, discussing and communicating. Cronbach’s alpha for the total scale is .73.

Parental Support Scale (PSS)
The Parental Support Scale (Khamis, 2000) was used to assess child’s degree of satisfaction with parental support. The evaluations of items were rated on a 7-point rating scale ranging from 10 (very dissatisfied) to 70 (highest possible satisfaction). Items dealt with tangible support (e.g., presents, rewards, money, food, and clothing) emotional support (e.g., affection, love, warmth), and social support (e.g., help, caring). Cronbach’s alpha for the scale is .89.

Gender Inequities Scale (GIS)
The Gender Inequities Scale (Khamis, 2000) was used to measure children perceived fairness regarding parents’ gender preferences. Functions of parental gender bias reflected practices regarding rewards, support, help, empathy, and responsive caregiving. Cronbach’s alpha for the total scale is .76.

Harsh Discipline Scale (HDS)
The harsh discipline scale (Khamis, 2000) was used to measure children’s perception of parent’s rearing practices. The 6 items on the HDS refer explicitly to harsh discipline such as coercive punishment, immediate obedience to parental orders, monitoring and directing activities. The items were rated on a 5-point Likert scale ranging from 6 (very lenient) to 30 (very harsh discipline). Cronbach’s alpha for the total scale is .74.

Statistical Analyses
To simplify data analyses, the number of predictor variables considered was reduced. This was accomplished by identifying variables significantly associated with ADHD symptomatology through t tests, and chi-square analyses. Then logistic regression was used to predict ADHD in children. Inclusion of many of the significant demographics and contextual variables is important since they are viewed as factors that influence the ADHD symptomatology. All logistic regressions presented are simultaneous models, which means that all variables are adjusted (i.e., controlled) for all other variables in the model simultaneously. For each regression, odds ratio (OR), r, and R² statistics are provided. The r and R² statistics in logistic regression are useful analogs to the partial r correlation and the R² statistics in linear regression, respectively, but are not fully equivalent (see Hosmer & Lemeshow, 1989; Kleinbaum, Kupper, & Morgenstern 1982). To denote this, the subscript p is used (i.e., rp and R²p) to indicate that these should be interpreted as pseudo r and R² statistics, respectively. In cases where the predictor variable is significant and is a dichotomous variable (e.g., gender), the OR is reported in the text and is readily interpretable: it indicates the odds of having a current disorder when the predictor variable
changes from 0 to 1, controlling for all other variables in the model. When the predictor has more than two categories (e.g., parental support), the OR represents the change in the odds of having a current disorder per unit change in the predictor variable and, hence, is not as readily interpretable in terms of effect magnitude. Consequently, when a predictor is significant and has more than two categories, the $r$ analog ($r_p$) is reported in the text instead of the OR. All statistical analyses were performed using SPSS Version 15.

Results

Prevalence of ADHD among school age children

The present findings in this sample indicate that the prevalence of ADHD among school age children is 12.5 %, and that the prevalence ratio varied across the three ADHD subtypes, with the following rates; 1.5 % for the combined type, 7.5 % for the inattentive type, and 3.5 % for the hyperactive-impulsive type. The following is the analyses of the results of the ADHD subtypes separately.

ADHD Inattentive Type

In regard to child characteristics, the results indicated that there were statistically significant differences between ADHD children inattentive type and non-ADHD children, in regard to gender $X^2 (1,185) = 5.83, p = 0.01$; and school performance $t (198) = 3.91, p = 0.0001$ (see Table 1). The prevalence of ADHD inattentive type was higher among males (12%) than females (3%). Also, children with ADHD inattentive type had lower school performance than did non-ADHD children.

With respect to parent’s sociodemographics, no statistically significant differences were found between ADHD children inattentive type and non-ADHD children, in regard to family income. However, significant differences were found for father’s education, $t (198) = -4.56, p = 0.0001$; and mother’s education, $t (198) = 2.59, p = 0.01$. While the educational level of mothers of ADHD children inattentive type was lower than mothers of non-ADHD children, the educational level of fathers were higher.

In regard to family environment and parenting, ADHD children inattentive type reported higher levels of gender inequities, $t (198) = -3.64, p = 0.0001$ (see Table 1). There were no statistically significant differences between the two groups in regard to family ambiance, parental support, and harsh discipline.

<table>
<thead>
<tr>
<th>Variable</th>
<th>ADHD Inattentive type</th>
<th>Non-ADHD</th>
<th>ADHD Hyperactive Impulsive type</th>
<th>Non-ADHD</th>
</tr>
</thead>
<tbody>
<tr>
<td>School Performance</td>
<td>63.80/9.38</td>
<td>76.83/12.59</td>
<td>69.71/11.72</td>
<td>76.08/12.84</td>
</tr>
<tr>
<td>Family Income</td>
<td>11733/3453</td>
<td>12027/5169</td>
<td>9000/2943</td>
<td>12113/5086</td>
</tr>
<tr>
<td>Father Education</td>
<td>10.60/4.96</td>
<td>5.05/4.48</td>
<td>8.42/5.74</td>
<td>5.36/4.68</td>
</tr>
<tr>
<td>Mother Education</td>
<td>1.80/.41</td>
<td>4.38/3.84</td>
<td>2.14/.69</td>
<td>4.26/3.81</td>
</tr>
<tr>
<td>Family Ambiance</td>
<td>28.00/1.30</td>
<td>29.35/4.05</td>
<td>27.57/2.29</td>
<td>29.31/3.96</td>
</tr>
<tr>
<td>Parental Support</td>
<td>46.80/1.42</td>
<td>49.63/7.34</td>
<td>48.14/1.21</td>
<td>49.46/7.23</td>
</tr>
<tr>
<td>Gender Inequities</td>
<td>26.00/2.07</td>
<td>22.23/3.94</td>
<td>25.42/3.03</td>
<td>22.41/3.94</td>
</tr>
<tr>
<td>Harsh Discipline</td>
<td>19.66/1.44</td>
<td>19.50/3.22</td>
<td>21.57/2.50</td>
<td>19.44/3.12</td>
</tr>
</tbody>
</table>

Note. Means for the variables appear prior to the slash (/), and their standard deviations appear after the slash.

The results of the logistic regressions are shown in Table 2. They indicate that ADHD inattentive type was positively associated with gender, and harsh discipline. The odds ratio for child’s gender was significant ($OR = 31.04; p < .002$), indicating that males were more likely to receive ADHD inattentive type diagnosis than females. Among family environment and parenting variables, ADHD children inattentive type reported higher levels of harsh disciplining ($r_p = -.58, p = 0.05$).

ADHD Hyperactivity-Impulsivity Type

In regard to child characteristics, the results indicated that there were no statistically significant differences between ADHD children hyperactivity-impulsivity type and non-ADHD children, in regard to gender, age, and school performance (see Table 1). Therefore, the symptoms of hyperactivity and impulsivity in children with ADHD are exhibited across gender, age, and various performance levels.
With respect to parent’s sociodemographics, no statistically significant differences were found between ADHD children hyperactivity-impulsivity type and non-ADHD children, in regard to family income as well as the educational level of mothers and fathers. In other words, the hyperactivity and impulsivity symptomatology in children with ADHD did not vary according to their diverse backgrounds.

Among the family environment and parenting variables, the only significant differences found between ADHD hyperactivity-impulsivity type and non-ADHD children was on the gender inequities scale $t(198) = -1.99, p = 0.04$ with ADHD children hyperactivity-impulsivity type reported higher levels of gender inequities (see Table 1). Children who reported that they were subjected to gender discrimination and bias in their families in terms of receiving rewards, support, help, empathy, and responsive care-giving exhibited symptoms of hyperactivity-impulsivity more than children who didn’t suffer from gender bias in their families.

Logistic regression was used to predict ADHD hyperactivity-impulsivity type. The results indicated that none of the child characteristics, parent’s sociodemographics, and family environment and parenting were significant predictors of ADHD hyperactivity-impulsivity type.

### Table 2. Logistic Regression Predicting ADHD Inattentive type and ADHD Hyperactive – Impulsive type

<table>
<thead>
<tr>
<th>Variable</th>
<th>ADHD Inattentive type</th>
<th>ADHD Hyperactive – Impulsive type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>b = 3.43, t = .17</td>
<td>OR = 31.04**</td>
</tr>
<tr>
<td>School Performance</td>
<td>b = -0.04, t = -2.26</td>
<td>OR = .95</td>
</tr>
<tr>
<td>Family Income</td>
<td>b = .000, t = -0.30</td>
<td>OR = 1.00</td>
</tr>
<tr>
<td>Father Education</td>
<td>b = .58, t = 1.27</td>
<td>OR = 1.78</td>
</tr>
<tr>
<td>Mother Education</td>
<td>b = -3.32, t = -1.38</td>
<td>OR = .03</td>
</tr>
<tr>
<td>Family Ambiance</td>
<td>b = -1.84, t = -1.10</td>
<td>OR = .83</td>
</tr>
<tr>
<td>Parental Support</td>
<td>b = .22, t = .25</td>
<td>OR = .79</td>
</tr>
<tr>
<td>Gender Inequities</td>
<td>b = .23, t = 3.25</td>
<td>OR = 1.26</td>
</tr>
<tr>
<td>Harsh Discipline</td>
<td>b = -5.8, t = 1.51</td>
<td>OR = .55</td>
</tr>
</tbody>
</table>

Gender is coded: Male=1; Female=0. School Performance is coded: Cumulative Average. Educational level of Mothers and Fathers are coded in Years. Family Income is coded in Dirham. Family Ambiance is coded: 5-point scale ranging from 7 to 35. Parental Support (PSC) is coded: 5-point ranging scale ranging from 10 to 100. Gender Inequities is coded: 5-point ranging scale ranging from 8 to 40. Harsh Discipline (HD) is coded: 5-point scale ranging from 6 to 30.

* $p < .01$; ** $p < .001$

### Discussion

The results of the current study indicate that the overall prevalence rate of ADHD was 12.5% among United Arab Emirates school-age children, with most children showing symptoms that are predominantly inattentive, followed by those who are predominantly hyperactive-impulsive, and those who exhibit a combination of all symptoms- the combined type. Although the proportion of children identified as ADHD may be higher than the estimates of the DSM (APA, 1994), the results are more or less consistent with previous findings on UAE children which reported an overall prevalence rate of 14.9% (Bu-Harooon, Eapen, & Bener, 1999). Yet it was inconsistent with the results of a recent study on Arab children (i.e., Palestinians) which has indicated a much higher prevalence rate of 34.1%. Differences in the prevalence rate of ADHD may be attributed to the fact that Palestinian children live in difficult circumstances, and experience a considerable number of difficulties and stressors which may engender substantial harm to them and make them more susceptible to the development and/or maintenance of the disorder (Khamis, 2006). Nevertheless, the results of this study yielded similar rates of ADHD among children from various countries (Baumgaertel, Wolraich, & Dietrich, 1995; Gaub & Carlson, 1997; Hinshaw, 1994; Pineda, Ardila, Rosselli, Arias, Henao, Gomez, Mejia, & Miranda, 1999). This is likely due to the similarity in research design, which relied on teachers’ ratings in which prominent symptoms were only displayed in the school setting. An earlier study carried out in UAE (Daradkeh, 1993) noted that teachers may be more accurate in their ratings of ADHD among school-aged children. Also, consistent with previous findings (Barkley, DuPaul, & McMurtry, 1990; Cantwell & Satterfield, 1978; Holborow & Berry, 1986; Lambert & Sandoval, 1980; McKinney, Mason, Perkerson, & Clifford, 1975), children with
ADHD inattentive subtype displayed significant academic underachievement compared to non-ADHD children.

Consistent with previous findings the prevalence of ADHD was much more common among males than females (Bu-Haroon, Eapen, & Bener, 1999; Khamis, 2006), with males showing more symptoms of the inattentive type rather than the hyperactive-impulsive type. However, in a recent study on Arab children (i.e., Palestine), males were found to have a higher rate of symptoms of the hyperactive-impulsive and combined types rather than the inattentive type (Khamis, 2006).

Consistent with previous findings (Barkley, DuPaul, & McMurray, 1990; Cantwell & Satterfield, 1978; Holborow & Berry, 1986; Lambert & Sandoval, 1980; McKinney, Mason, Perkerson, & Clifford, 1975), children with ADHD inattentive subtype displayed significant academic underachievement compared to non-ADHD children.

While gender inequities were found to be associated with ADD and ADHD in UAE school age children, this variable was not a significant predictor in the final models. Nevertheless, the analyses of the results emphasized the crucial role of harsh discipline in predicting ADD symptomatology in UAE children. Children with ADD symptoms were more likely to report higher levels of parental harsh discipline such as coercive punishment, immediate obedience to parental orders, monitoring and directing activities. The results are consistent with previous studies that linked gender inequities and harsh discipline (Buhrmester et.al.,1992; Gardner ,1994; Khamis, 2006) , childhood maltreatment (Egeland, 1985; Rosenzweigh & Kaplan, 1996), and conflicted patterns of family communication (Barkley, Antastopoulous, Guevremont, & Fischer, 1992) to attention problems. Since causal statements cannot be supported by correlational results, additional investigations are needed to identify family contextual variables (e.g., influence of parental styles) that may account for differences observed in ADHD symptomatology among children.

To summarize, the results of the current study reveal the existence of ADHD symptomatology among UAE school-age children. As a result there is an urgent need for policies aimed at identifying, preventing, and treating this childhood disorder in schools. At the same time, the public school system has to emphasize remedial education aimed at improving the study skills and academic achievement of children with ADHD, particularly those who are at high risk for ADHD such as males and children who are subjected to harsh disciplining in their home environment.

Interventions directed towards the family could be used to promote more positive styles of parental influence. Such interventions may include parental awareness programs that would draw attention to the adverse affects of gender inequities, and harsh disciplining. This could be achieved through in-service workshops and training programs directly aimed at parents’ awareness and empowerment in an attempt to alter or change their orientations towards child-rearing practices. While the main findings provide some reassurance that success resulting from evidence-based ADHD treatments is related to the degree of change in negative/ineffective discipline (Hinshaw et al. 2000), policies are needed to include diagnostic and clinical procedures in the school setting.

References


The purpose of this study was to investigate the differential classroom structure and efficacy reported by general and special educators at the elementary and secondary level. General and special educators (n = 774, return rate of 37%) from a large school district in the southeast US participated in the study. The participants completed a modified version of the Bender Classroom Structure Questionnaire in order to determine their use of cognitive strategies, management strategies, and individualized instructional strategies. In addition, the teachers completed a modified version of the Teacher Efficacy Scale to probe their efficacy in serving students with disabilities. A Multivariate Analysis of Variance (MANOVA) was conducted to determine level of variance within and between participants. Findings indicate differences in classroom structure between elementary and secondary settings and that special and general educators differed in their instructional practices.

The No Child Left Behind Act (NCLB, 2001) mandates that each state be accountable for the continuous academic achievement of all students. Under NCLB students with disabilities should also be held accountable for the same academic achievement as their peers without disabilities. Another challenge inherent in the rigorous mandates of NCLB is the legal mandate issued with the Individuals with Disabilities Education Improvement Act (IDEA, 2004). IDEA requires that the individualized needs of students with disabilities be taken into consideration during education planning. How do today’s educators resolve the dissonance created by the contradictions in these mandates regarding students with disabilities?

NCLB mandated that each state have highly qualified teachers in all classrooms by the end of the 2005-06 school year. The shortage of qualified special education teachers may be the greatest challenge that has ever faced public education (Billingsley, 2002; Boe, Cook, & Sunderland, 2008; Gilmore, Marsh, & Garza, 1999). With fewer qualified special education teachers, there are fewer opportunities for students with disabilities to receive appropriate services and thus compromise the likelihood for adequate achievement (Kaff, 2004). In relation, programs which have attempted to fill the shortage of teachers such as Teach for America and other alternative certification programs put teachers in classrooms with minimal training, summer preparatory courses and then provide pedagogical instruction to these teachers while on the job for two years at a time hoping these teachers will remain in the classroom (Teach for America, 2005). Though these alternative routes to preparation provide teachers for classrooms, attrition and retention research of special education teachers has shown that under preparedness is a significant factor in teachers leaving the field (Billingley, 2004; Gersten, Keating, Yovanoff, Harniss, 2001). Thus there is no clear remedy to the shortage of qualified teachers in the near future.
To better understand the challenges educators face in today’s schools particularly in serving students with disabilities, the field must continue to investigate the perceptions and practices of classroom teachers. As has been reported in previous studies, teachers’ perceptions are critical features of classroom dynamics and classroom instruction (Lago-Dellelo, 1998; Semmel, Abernathy, Butera & Lesar, 1991; Bender & Ukeje 1989; Shippen, 2001; Villa, Thousand, Meyers, & Nevin, 1996). The differences in elementary and secondary settings may be a factor in teacher perceptions of serving students with disabilities.

**Teachers’ Efficacy and Perceptions of Serving Students with Disabilities**

As the direct service providers, general and special educators represent a vital link to successful academic and behavioral outcomes for students with disabilities in inclusive settings (Lago-Dellelo, 1998). DeBettencourt (1999) found that general education teachers were concerned with the limited number of special education courses that they had taken as a part of their academic training. In addition, research has indicated that general educators are less supportive of inclusion than are special educators (Bender, Vail, & Scott, 1995; Minke & Bear, 1996; Monahan, Marino, & Miller, 1996; Scruggs & Mastropieri, 1996). Other studies have noted that even pre-service general educators have reported concerns about serving students with disabilities (Kirk, 1998; Shippen, Crites, Houchins, Ramsey & Simon, 2005).

Teachers’ perceptions of the learning and behavioral characteristics of students with disabilities appear to mediate instruction and may influence classroom dynamics (Lago-Dellelo, 1998; Klingner & Hughes, 2000). Positive teacher perceptions influence the success of students with disabilities in general education classes and are directly related to accommodations teachers are willing and able to provide (Ysseldyke, Thurlow, Christenson, & McVicar, 1988). The accommodations that teachers provide may be related to level of technical assistance that they receive in order to support students with disabilities (Gersten, Walker, & Darch, 1988). Cook, Semmel, and Gerber (1999) argue that there is a need to relate teacher perception to teacher practice. A starting point for relating teacher perceptions may be differences between elementary and secondary educators.

**Contrasts in Elementary and Secondary Settings**

Thousand, Rosenberg, Bishop, and Villa (1997) pointed out that differences in organizational and academic structure between elementary and secondary schools make it difficult to develop inclusive programs at the secondary level. A critical issue that impacts secondary teachers’ ability to address the needs of students with disabilities is the content-driven academic nature of secondary education. The challenge of serving students with disabilities may be further aggravated with the push for inclusion (Cook, 2004). Research has revealed that when students with disabilities are included in general education classrooms, their teachers are unlikely to alter their traditional whole-group instructional strategies in favor of specific individualized adaptations (Scott, Vitale, & Masten, 1998).

The mandate to deliver standards-based content to diverse students increases teachers’ responsibilities in the inclusion of students with disabilities in both elementary and secondary settings. Because secondary classrooms tend to be teacher-centered and only rarely provide student-centered instruction, secondary teachers may need a better understanding of how best to serve all students including students with disabilities (Cole & McLeskey, 1997). Shippen (2001) found that more experienced secondary teachers had less positive attitudes toward including student with disabilities. These philosophical barriers may impact instructional choices for students with disabilities as academic achievement is now mandated by NCLB.

In the elementary setting, classroom structure tends to be more student-driven. Studies have found that some of the same issues that exist on the secondary school level also exist within the elementary level (Stockall & Gartin, 2002). For example Cook (2004) found within inclusive elementary school settings teachers’ perceived preparedness significantly influenced their ability to manage behavior and academic engagement. Diverse learning needs striated across many students cause significant challenges in instruction in elementary schools.

The diverse learning needs of students with disabilities have been facilitated by smaller groups and adjusting the learning objectives through individualized learning goals (Fuchs, Fuchs, Kazdan, Karns, Calhoon, et al., 2000; Stockall & Gartin, 2002). Generally in the early elementary grades, students are being instructed on how to learn (e.g., strategies) rather than what they learn (e.g., content). The strategic method of instruction is more widely accepted on the elementary level over content driven outcomes on
The elementary school classroom has often been viewed as an ideal place to include students with disabilities (Fuchs et al., 2000; Cook 2004). Current school reform efforts have steadily increased the rate of inclusion for students with disabilities particularly in elementary settings as it is seen as advantageous to students with and without disabilities (Scruggs & Mastropieri 1996; Office of the President, 2002). With NCLB inclusive practices are seen as a way to provide quality instruction to children with disabilities, yet it is important to note that research on inclusion as an academic intervention is not definitive (Stockall & Gartin, 2002; Zigmond & Baker 1996).

Students with disabilities educational needs are individualized as mandated in IDEA. This is clear in the achievement gap reported through NCLB’s adequate yearly progress (AYP). This factor may also add to teachers’ negative attitudes towards working with students with disabilities. This may become a confounding factor in the delivery of instruction to students with disabilities as previous studies have shown teachers already had negative attitudes toward instruction of these students (DeBettencourt, 1999). Specifically, secondary teachers with more experience reported more negative attitudes toward working with students with learning difficulties (Embich, 2001; Lobosco & Newnan, 1992; Shippen, 2001). Secondary schools are driven by content oriented tests and instruction. Often students with disabilities continue to need the individualized instruction and cognitive strategies they received in elementary school. However, classroom structure seems to differ in elementary and secondary settings.

Classroom Structure and Teacher Practice
In defining the research to practice gap in inclusion, the vital question is What strategies are teachers implementing in general classes to accommodate students with disabilities? A research synthesis by Scott, Vitale, and Masten (1998) addressed the implementation of instructional adaptations for students with disabilities in inclusive classrooms. This review of research compiled and analyzed the results of 21 studies investigating the instructional adaptations provided by teachers to students with disabilities.

Throughout their literature review, Scott et al. (1998) discovered recurring categories of support used in inclusive classrooms. These categories fell within the framework of either typical or substantial instructional or curricular adaptations. The categories of adaptations included (a) modifying instruction, (b) modifying assignments, (c) teaching learning skills, (d) altering instructional materials, (e) altering curriculum, (f) varying instructional grouping, (g) enhancing positive behavior, and (h) facilitating progress monitoring. These adaptations were reported to be the favored adaptations used by teachers. Table 1 provides a summary of adaptations provided in general education classes that have been reported in the literature.

| Table 1. Adaptations provided in general education reported in the literature |
|---------------------------------|--------------------------------|
| Category of General Education Adaptation | Specific Adaptations |
| Instructional Delivery | Use Peer Tutors  |
| | Use Resource Staff  |
| | Use Computer Assisted Instruction  |
| | Provide Advanced Organizers  |
| | Provide On-going Feedback  |
| | Break Down Tasks  |
| Instructional Materials | Modify Testing Formats  |
| | Modify Student Materials  |
| Contextual Adaptations | Establish Rapport  |
| | Homogeneous Grouping  |
| | Adapt the Daily Routine  |
| | Provide Extra Time  |
| Environmental Adaptations | Change Test Setting  |
| | Seat Students in a Quiet Area  |
In an earlier study Bender and Ukeje (1989) reported similar instructional adaptations to Scott et al. (1998), but also linked teachers’ choices of strategy to attitudes of serving students with disabilities and teacher efficacy. For example, Bender and Ukeje stated, *The teachers’ use of effective instructional strategies has been consistently related to teacher attitudes concerning personal teaching effectiveness* (p. 28). To this end, teacher attitudes may be a major determinant in selection of instructional strategies for students with disabilities in the general education classroom.

The purpose of this study was to investigate the differences in classroom structure reported by general and special educators at the elementary and secondary level. By investigating classroom structure and teacher practice, researchers may have a clearer demonstration of how and why teachers implement the strategies that they do. Further, the researchers hypothesized that teacher type (general or special educator) and level (elementary or secondary) would be important factors in their reporting of classroom structure and instructional practices.

**Method**

A survey packet containing modified versions of the Bender Classroom Structure Questionnaire (BCSQ) (Bender, Smith, & Frank, 1988), the Teacher Efficacy Scale (TES) (Gibson & Dembo, 1984) and a cover letter was distributed in a large school district in southeastern US. Participants were general and special educators in the (n = 774). Two weeks after the surveys were distributed; the first author collected the completed surveys from each school site. A 37% return rate was established.

**Participants and Setting**

Participants included (n = 774) general and special education teachers from a large school district in the southeastern United States. Eighty four percent (n = 650) were general educators, while 16 % (n = 124) were special educators. Fifty three percent (n = 412) were elementary educators, while 47% (n = 362) were secondary educators. Years teaching experience reported by participants ranged from 0-5 years (32%), 6-10 years (21%), to 11 or more years (47%).

The school district where the study took place had 55 schools and reported demographic data indicating that during the year prior to data collection for the current study, the district population was 34,044 students. Seventy-three percent of the student population was classified as non-White and 27% were classified as White. Sixty percent of the school population were eligible for free and reduced meals. The system-wide graduation rate was 89%.

The average number of years teaching experience for all teachers in the district was 12. Sixty-one percent of faculty members had advanced degrees (e.g., masters and education specialist). The special education population comprised 11.7% of the total school population. The criteria for participation in the study included (a) being employed by a public school in a teaching capacity and (b) being willing to participate by completing the survey.

**Dependent Measures**

The dependent measures were a modified version of the Bender Classroom Structure Questionnaire (BCSQ) (Bender et al., 1988) and a modified version of the Teacher Efficacy Scale (TES) (Gibson & Dembo, 1984). The BCSQ was used to determine the types of cognitive strategies, management strategies, and individualized instructional strategies used by teachers. The modified BCSQ employed a 20-item Likert-type scale ranging from 1 to 5 with responses varying from *only rarely* (1) to *almost always* (5) which covered a wide range of cognitive, instructional and management strategies. According to Bender et al. BCSQ survey yields a 3-factor structure of teacher practices including (a) individualized instructional strategies, (b) cognitive learning strategies, and (c) classroom management strategies. A confirmatory factor analysis was conducted to verify that modified version of the BCSQ used in this study maintained the survey’s original factor structure. See Table 2 for factor loadings of the modified version of the BCSQ.

The modified version of the Teacher Efficacy Scale (TES) (Gibson & Dembo, 1984; Deemer & Minke, 1999) was changed to specifically probe teachers’ efficacy in serving students with disabilities. Within each question the terms *with disabilities* were added after student. For example, the item *When a student in my class does better than usual, many times it is because I exerted a little extra effort* was change to read *When a student with disabilities in my class does better than usual, many times it is because I exerted a little extra effort*. See Table 3 for sample items from the TES.
Table 2. Exploratory and confirmatory factor loadings for the BCSQ

<table>
<thead>
<tr>
<th>20 Items from the modified BCSQ</th>
<th>Exploratory Factor Loadings (Bender et al., 1988)</th>
<th>Confirmatory Factor Loadings (current study)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Students receive verbal praise from each other</td>
<td>.56</td>
<td>.39</td>
</tr>
<tr>
<td>2. Peer tutoring is used to assist slow learners</td>
<td>.59</td>
<td>.50</td>
</tr>
<tr>
<td>3. I use physical touch, such as a pat on the back, as a reinforcer</td>
<td>.63</td>
<td>.30</td>
</tr>
<tr>
<td>4. I individualize in my class when necessary</td>
<td>.64</td>
<td>.57</td>
</tr>
<tr>
<td>5. Students are encouraged to help each other informally on learning tasks</td>
<td>---</td>
<td>.36</td>
</tr>
<tr>
<td>6. I try to determine how students learn best</td>
<td>.70</td>
<td>.72</td>
</tr>
<tr>
<td>7. The class emphasizes correction of worksheets</td>
<td>.76</td>
<td>.42</td>
</tr>
<tr>
<td>8. Students must raise their hand before standing</td>
<td>--</td>
<td>.66</td>
</tr>
<tr>
<td>9. I ask, How did you learn that? or some other question to focus on learning strategies</td>
<td>.69</td>
<td>.40</td>
</tr>
<tr>
<td>10. I suggest particular methods of remembering</td>
<td>--</td>
<td>.54</td>
</tr>
<tr>
<td>11. I determine early in the year if a student needs the same concepts covered in several different ways</td>
<td>.76</td>
<td>.57</td>
</tr>
<tr>
<td>12. I use reading materials that highlight the topic sentence and main idea for slow learners</td>
<td>.63</td>
<td>.56</td>
</tr>
<tr>
<td>13. Students are taught to use their own inner language to give themselves silent task instructions</td>
<td>.60</td>
<td>.65</td>
</tr>
<tr>
<td>14. I encourage students to share various techniques, which may help them memorize facts in class</td>
<td>.51</td>
<td>.30</td>
</tr>
<tr>
<td>15. The class reviews assignment papers when I return them.</td>
<td>.56</td>
<td>.43</td>
</tr>
<tr>
<td>16. Several students may be walking around in my class at any one time retrieving materials</td>
<td>.52</td>
<td>.47</td>
</tr>
<tr>
<td>17. I insist that doors be shut and students stay in their seats to minimize distractions</td>
<td>--</td>
<td>.74</td>
</tr>
<tr>
<td>18. I emphasize the importance of working quietly</td>
<td>.70</td>
<td>.73</td>
</tr>
<tr>
<td>19. I praise students for successful work whenever possible</td>
<td>.70</td>
<td>.77</td>
</tr>
<tr>
<td>20. I use class privileges as rewards for work.</td>
<td>.61</td>
<td>.49</td>
</tr>
</tbody>
</table>
Table 3. Sample items from the modified TES

<table>
<thead>
<tr>
<th>Sample Item</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Professional Efficacy</strong></td>
<td>When a student with disabilities is having difficulty with an assignment, I am usually able to adjust to his/her level. If a student with disabilities masters a new concept quickly, this might be because I knew the necessary steps to teach that concept.</td>
</tr>
<tr>
<td><strong>Personal Efficacy</strong></td>
<td>A teacher is very limited in what he/she can achieve because a student with disabilities’ home environment is a large influence on his/her achievement. Even a teacher with good teaching abilities may not reach many students with disabilities.</td>
</tr>
</tbody>
</table>

**Data Analysis and Results**

The statistical analyses of the data included a confirmatory factor analysis of the modified BCSQ and multivariate analyses of variance (MANOVA) of both dependent measures and their subscales. The confirmatory factor analysis for the BCSQ employed a principal components varimax rotation and yielded a three-factor structure and accounted for 39% of the variance in participant responses. Factor loadings of .30 or greater met the minimum level (Hair, Anderson, Tatham, & Black, 1998). The first confirmatory factor structure (individualized instructional strategies) heavily loaded on items such as *individualize in my classroom when necessary* and *I determine early in the year if a student needs the same concepts covered in several different ways*. The second confirmatory factor structure (cognitive strategies) heavily loaded on items such as *I use reading materials that highlight the topic sentence and main idea for slower learners* and *Students are taught to use their own inner language to give themselves silent task instructions*. The third confirmatory factor structure (management strategies) heavily loaded on items such as *I insist that doors be shut and that students stay in their seats to minimize distractions* and *I emphasize the importance of working quietly*. See Table 2 for exploratory and confirmatory factor loadings of the BCSQ.

The MANOVA was conducted as a 4 (general, special, elementary, and secondary educator) x 7 (cognitive strategies, management strategies, individualized instructional strategies, overall BCSQ, personal efficacy, professional efficacy and overall TESSD) analysis. The seven subscales or dependent variables are based on the mean scores of the five individual factors yielded by the BCSQ (three factors) and the TESSD (two factors) and the two overall mean scores for both measures.

No main effect for the dependent measures was found for teacher type (general and special), but the analysis nearly reached significance, Wilks’ lambda $\lambda = .97, F(7, 466) = 1.96, p = .06$. Level (elementary and secondary) yielded a significant main effect for the dependent measures, Wilks’ lambda $\lambda = .97, F(7, 466) = 2.29, p < .05$. A significant interaction effect was found for the dependent measures between teacher type and level, Wilks’ lambda $\lambda = .97, F(7, 466) = 2.30, p < .05$. Specifically, univariate tests for between subject effects for the independent variable Level (elementary or secondary) on the efficacy factors indicate no significant difference in personal, professional or overall teacher efficacy. However, univariate tests between subjects were highly significant on the classroom structure factors of individualized instructional strategies and cognitive strategies $p < .01$. See Table 4 for MANOVA main effect and interaction effect and Table 5 for follow up pairwise comparisons.

Table 4. Multivariate analysis of variance main and interaction effect results

<table>
<thead>
<tr>
<th></th>
<th>Value</th>
<th>F</th>
<th>Hypothesis df</th>
<th>Error df</th>
<th>Sig</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level</td>
<td>Wilks’ Lambda</td>
<td>.97</td>
<td>2.29</td>
<td>7.00</td>
<td>466.00</td>
</tr>
<tr>
<td>Teacher Type</td>
<td>Wilks’ Lambda</td>
<td>.97</td>
<td>1.96</td>
<td>7.00</td>
<td>466.00</td>
</tr>
<tr>
<td>Level* Teacher Type</td>
<td>Wilks’ Lambda</td>
<td>.97</td>
<td>2.30</td>
<td>7.00</td>
<td>466.00</td>
</tr>
</tbody>
</table>
Discussion
The purpose of this study was to investigate the differences in classroom structure reported by general and special educators at the elementary and secondary levels in conjunction with their perceived effectiveness in delivering instruction to students with disabilities. Significant differences were found in the classroom structure between elementary and secondary classrooms. Teachers’ perceptions are critical features of classroom dynamics, structure and instruction (Bender & Ukeje, 1989; Lago-Dellelo, 1998; Semmel, et al., 1991; Villa, et al., 1996). Findings are discussed below in regard to practical implications and future research.

Findings on Contrasts in Professional Practices
The results of this study showed a primary difference between special and general educators in their professional practice. That is, special educators individualize instruction for students with disabilities to a much greater extent than do general educators. This is an important finding because previous research has consistently documented that the most successful teachers working with students with disabilities are proficient in individualizing instruction for these students. The difference between general and special educators may be due to differences in preparation since general educators report a lack of coursework within their preparation programs (deBettencourt, 1999). Pre-service general educators report concerns about teaching students with disabilities (Kirk, 1998; Shippen et al., 2005) and this lack of comfort may be related to their instructional practices.

The findings in differences in professional practices of general and special educators have implications for inclusive instruction. The National Study on Inclusion (1995) found that co-teaching was the most used instructional delivery method in inclusive classrooms. NCLB mandates related to teacher quality and student achievement make inclusive instruction and co-teaching teaching necessary, especially at the secondary level. The findings the current study imply that general and special educators differ in their instructional practices for students with disabilities. General and special educators need to work together to individualize instruction in order to ensure that students with disabilities make AYP. This may explain why general and special educators struggle with co-teaching according to researchers (Rice & Zigmond, 2000). Furthermore, the differences in professional practices may be related to findings that co-taught inclusive instruction has not been consistently shown to be an effective method of instructional delivery (Magiera & Zigmond, 2005; Stockall & Gartin, 2002; Zigmond & Baker, 1996).

Future Research
It is not known whether this study’s research findings would be similar in and/or across other regions of the U.S. Further research is needed to investigate teachers’ perceptions and practices with regard to
teaching students with disabilities. In addition, research is needed to investigate the similarities and differences in teachers’ perceptions and practices within and across different types of school districts, such as rural, urban, and suburban.

This study did not address whether teachers participated in inclusive or co-taught instruction. Future research might address whether these types of instructional situations influence teachers’ perceptions and practices. One of the limitations of survey research is the extent that teachers’ reports are representative of their actual practices. Future research might address this by collecting data regarding student achievement and/or observing classroom instruction in addition to surveying teachers. This limitation might also be addressed by surveying teachers regarding their perceptions and practices as well as students with disabilities with regard to their perceptions of their teachers’ attitudes and practices.

References
Individuals with Disabilities Education Improvement Act of 2004, PL 101-476.
DISABILITY AND ADULTHOOD IN, MEXICO: AN ETHNOGRAPHIC CASE STUDY

Michael Skivington
University of Wisconsin Oshkosh

This study sought to better understand the cultural meaning of adulthood and disability in a large city in central Mexico. Using an ethnographic case study research design that included interviews and observations, this study addressed the research question: What is the cultural meaning and accompanying challenges of becoming an adult with disability in Cuernavaca, Morelos, Mexico? Results indicate that the adult life of a person with a disability is difficult. Corruption, societal rejection, and inadequate school and social services are challenges this population faces. Analyses also revealed that Wolfensberger’s (1972) original depiction of the social roles people with disabilities play in society was still accurate in today’s Mexico. Research findings and implications for future study are also discussed.

The United Nations Education, Scientific and Cultural Organization (UNESCO) initiatives of past few decades reflect a growing worldwide concern for the quality of life for people with disabilities. A review of the policy, practice and service documents available through UNESCO detail concerns about access to education and other services for children and adults with disabilities. For example, in a 1993 paper prepared for UNESCO, Hegarty described a variety of concerns regarding the educational needs of children with disabilities. Transition to adulthood was included within these needs as Hegarty specifically pointed to the need to help children with disabilities become economically active and lead lives that are as full and independent as possible (Hegarty, 1993, p. 24). Hegarty further described the need for action in employment, useful work and valued activity; personal autonomy; community involvement, social and leisure activity; and domestic living (p.51).

Building on the work of Hegarty and others, UNESCO convened the World Conference on Special Needs Education: Access and Quality in Salamanca, Spain in June of 1994. The World Conference, attended by over 300 participants, representing 92 governments, and 25 international organizations, focused on improving the lives of people with disabilities through inclusive education, Education for All, and preparing students with disabilities for their adult lives. The product of this conference, The Salamanca Statement and Framework for Action on Special Needs Education (UNESCO, 1994), represented a worldwide consensus regarding the then current situation for special needs education and gave direction for future advances in a variety of special needs education related areas, including transition.

Subsequent UNESCO documents, including the Convention of the Rights of Persons with Disabilities (Office of the United National High Commissioner for Human Rights, 1996-2007) promotes learning and life skills for young people and adults with disabilities. Furthermore, they specifically promote the right to live independently, be included in their communities, and have an education that will allow them to participate in their societies, work and employment, among other rights. Thus, world-wide concerns continue to include the preparation of all young adults for meaningful adult lives.

Little is known about the state of services for and the lives of students and adults with disabilities in Mexico. Mexican responses to the 1993/1994 UNESCO surveys indicated an emerging concern for special education and the lives of people with disabilities, but described very little concrete action taken to improve special education services. The former Mexican president (2000-2006), Vicente Fox, and his administration claimed that special education schools and students would receive renewed priority when he took office in 2000. However, in a recent of study of the state of special education services in Mexico,
only forty-two percent of the country has an area school for students with disabilities (Ortiz as cited in Aviles, 2006). Furthermore, only fifty-three out of a total of four hundred and fifty-seven teacher training schools (Normales) provide licenses in special education. As a result, it should come as no surprise that out of over one million teachers in Mexico, only forty-five thousand are special educators. In addition of the paucity of qualified special educators in Mexico, Mexican funding of special education schools is abysmal, providing less than twenty thousand pesos annually (approximately two thousand US dollars) to each special education school. This fact was specifically noted by the Director of Educational Innovation for the Secretary of Public Education (Secretaría de Educación Pública - SEP), in an official statement provided by the government, when she stated, *we gave them nothing*. (p.1). Clearly, special education in Mexico is not a priority for the Mexican government.

While there continues to be a need for more published research studies about the current state of special education in today’s Mexico, in general, even less has been published regarding expectations for adults with disabilities and transition from school to adult life for youth with disabilities in Mexico. However, Mexico’s response to the UNESCO survey indicates an interest in more integration of people with disabilities into mainstream society. Mexicans, like people from other countries, are becoming aware that more needs to be done to provide people with disabilities with educational and other life opportunities so they can to live, work, and participate more fully in their respective communities.

The UNESCO work and many of the current efforts identified in Mexico, while important and needed, reflect a medical model of disability. In this model, experts identify and label difference or impairment as disability, locating disability within the person, constructing disability as a distinct, knowable entity. Functional limitations or impairments are the primary causes of the problems individuals’ with disabilities encounter. As such, intervention, instruction, etc. provided by experts and targeting individuals with disabilities are the mechanisms used to address the problems caused by the functional limitations (Crow, 1996). However, the actions recommended by UNESCO also appear to reflect an understanding of the social nature of disability in which disability is seen as occurring because of interactions between environments and individuals (Crow, 1996). Because disability is seen as a constructed concept that exists in the intersection of individuals and environments, responses to problems focus on the interactions and not the individual, and include addressing environmental, attitudinal, and policy barriers individuals encounter (Devlieger, Rusch, & Pfeiffer, 2003). Many of the recommendations that have come out of the UNESCO, directed specifically at changing environmental and policy barriers, reflect the awareness of the social nature of disability.

This article reports on part of the results of a study designed to begin to understand the lives of people with disabilities in Mexico, particularly adolescents and young adults, and their preparation for adult roles in Cuernavaca, Morelos, Mexico. As a part of this study, I asked: What is the cultural meaning and accompanying challenges of becoming an adult with disability in Cuernavaca, Morelos, México?

The work conducted in this study reflects my view that disability is a social construction in which cultural beliefs, political factors, economic forces, and local values combine to give meaning to who is identified as *disabled* and what the ensuing personal, political and economic consequences are for individuals identified with disability labels. In fact, I concur with the call by Disability Studies in Education (DSE) scholars to interrogate and reject the all too often taken for granted deficit model lens of special education (Ferri, 2008). In the current study, I used special education not as an endorsement but as an entry point into the lives of people and families with disabilities. In fact, the very nature of the *two-school* system (for lack of a better phrase) is further evidence of marginalization on behalf of the Mexican government. Further, I support the central tenets and approaches to DSE theory. Among these is the contextualization of disability within political and social spheres, and contrasting medical, scientific and psychological understandings with social and experiential understandings of disability (Connor, Gabel, Gallagher, & Morton, 2008). Consequently, understanding how *disability* and its intersection with *adulthood* are constructed and enacted in Mexico is essential to understanding how families and schools prepare children and adolescents with disability labels to live their lives as adults. In choosing my main theoretical, I reviewed DSE theory and Bourdieu’s (1986) understanding of Social Capital theory that uses social power and control to reproduce inequity. I settled on the classic work of Wolfensbeiger (1972) whose work on marginalization and *othering* gave us sufficient support on which to begin to build as more becomes known about the cultural meaning of disabilities in México. Therefore, after I discuss the method employed for this study in the next section, I will discuss the research findings using the historical roles of people with disabilities vis-à-vis Wolfensbeiger’s theoretical viewpoint.
Method
I employed an ethnographic embedded single case design (Merriam, 1998; Yin, 2003) to emphasize the perspective of the research participants (Yin, 2003; Glesne, 1999; Merriam, 1998; Creswell, 1998), giving voice to the multiple realities that exist in their environments and within their cultures. In this study, I heard from three cultural groups, a Mexican special education school-community, professionals from a vocational special education school, Mexican families of students with disabilities (both attending the study school as well as schools in other parts of the city), and members of the Mexican communities in which people with disabilities live.

Setting
Cuernavaca is located in south central Mexico, and is approximately one hour and fifteen minutes by bus from the Mexico City airport. It is a major regional urban city of around one million people. Cuernavaca, the capital city of the state of Morelos, has characteristics similar to Mexico City (given its close proximity).

The state of Morelos has 18 schools (centers) for children with disabilities. These schools serve a disabled population that is estimated by official governmental statistics to be at 1.9% of the total population of the State of Morelos (INEGI, 2000).

The primary study school, one of the 18 special schools, is located on the south end of the city and is in a poor area surrounded by large weekend homes for wealthy people from Mexico City (Capitalinos). The school is set on a large parcel of land at the bottom of a steep hill. There is one gated entrance into the school. The gate remains closed and locked during the school day for the security of the students. Parents and other visitors must ring a doorbell and wait to be let in electronically. That entrance has steps and an accessible ramp. Unfortunately, the ramp is at such a steep pitch that its nickname is the assassin (la asesina).

The school serves students with all types of disabilities from pre-school through adulthood, enrolling over 200 students with disabilities such as autism, Down syndrome, and intellectual disabilities (mild to severe), and physical disabilities. The teachers represent different professional backgrounds with four of 13 teachers being licensed in special education. Of the nine remaining teachers, five were trained in human communication, three were trained in basic elementary education, and one was certified as an English teacher. The years of experience ranged from one year to more than fifteen years.

Participants
The initial participants for this study were chosen using a purposive selection procedure (Merriam, 1998). Because the study was about preparation of youth with disabilities for adult roles, the purposive sample started with individuals who are associated with a special education school. The primary study school was selected as a result of the activities of a pilot study. To gain entry to potential schools, during the pilot study I made contact with a director of a large private school in Cuernavaca. The study school was identified by the director of that school as a school whose faculty and families might be interested in working with me. This school is known as a Center of Multiple Attention (CAM) and was further identified as a Basic School, CAM Basic School (CAM Basica). The families, teachers and an administrator from this school served as the core set of participants. However, participants were also drawn from another special education school that had a direct relationship with the primary study school. This public special education school had a vocational training focus. As such, it was identified as a CAM Labor School (CAM Laboral). Participation increased as the study continued because of the snowball effect (Ream, 2003), using referral from key informants, and direct and indirect study participants, and included parents and other family members, school-related professionals, and community members.

Parents and other family members. Participating parents and other family members of students with disabilities were primarily from the study school; however, some of the community interviews were also with parents and family members of children and adults with disabilities who were not served at the study school. Of the twelve parent interviews at the study school, all were mothers of the children with disabilities, with the exception of one person who was a grandmother who had assumed the responsibility of raising her grandchild. By virtue of attendance at the public school, all families who were interviewed were poor or in some cases very poor people. The earnings of these families were at or below the average 2006 daily salary of a worker in the State of Morelos (including Cuernavaca) of 195.2 pesos per day, roughly less than 20 US dollars per day (INEGI, 2005). The educational levels of the
mothers ranged from a few years of primary education to college graduates. Most families lived in the area immediately surrounding the school and took public transportation to and from the school with one-way trips ranging from a few minutes to over an hour.

Three family interviews were conducted with community members, two interviews with mothers of children with disabilities and one with two adult siblings. The mothers were at a higher level of socio-economic status than the mothers at the study school and were able to provide private education to their children with disabilities. Furthermore, the mothers were also better educated. One had an advanced degree, and had stable home lives and cooperative spouses, even though they identified difficulties presented by having a family member with a disability. The community family interview with the older siblings was different because their sibling with a disability was nearly fifty years old; consequently, this interview provided a unique historical perspective with regard to the treatment and education of people with disabilities in Mexico.

School-related professionals. Nine professionals from the primary study school were interviewed. The directors of the CAM Basica and CAM Laboral schools were interviewed. Both directors have many decades of experience in the field of special education in the State of Morelos and both are trained in psychology. The director’s interview from the CAM Laboral served as the only faculty interview from that site. Each member of what the CAM Basica school called the support team (el equipo de apoyo) was also interviewed individually. The support team at this school consisted of a medical doctor, school psychologist, speech and language therapist, and a social worker. The years of experience for this team ranged from approximately two years to nearly twenty years of experience with students with disabilities. Also interviewed were two classroom teachers and the integration specialist at the study school.

Community members. Ten interviews were completed with members of the larger Cuernavaca community. The backgrounds of the interviewees include two veterinarians; two regular education teachers, one of whom worked in a private school and the other in a public school; a business leader; a director of human resources at a hotel/restaurant; the director of a private non-profit group; the founder and director of a private educational clinic; and a taxi driver.

Instrumentation
The interview protocol for this study evolved from the protocol used in the pilot study conducted in Mexico in the summer of 2004. The pilot protocol, consisting of open-ended questions, was geared towards probing parents’, teachers’, and administrators’ understanding of the special education and transition processes. For this study, the pilot interview protocol was altered to reflect additional or more specific issues that emerged in the pilot interviews and focused more specifically on transition and adult life. Questions in this protocol addressed attitudes of Mexicans about people with disabilities, overall employment opportunities for Mexicans with disabilities, the issues related to their employment, expectations for adults with disabilities in Mexico, and activities or programs related to preparing students with disabilities for their adult roles. The protocol was further modified during the study to reflect emerging trends in the data, allowing for deeper exploration of those trends that focused on school, family and support networks available to adults with disabilities. Questions also included those related to respondent demographics (e.g., education; relationship to people with disabilities, if appropriate; job/role, as appropriate).

Data Collection and Observation
Prior to beginning participant identification and data collection, I obtained approval from the human subjects review board. To adequately investigate the adult life for persons with disabilities and their preparation for adult life in the selected community, I conducted an in-depth study using extended time in the field. More specifically, I spent nine months in daily, direct participant-observation of all aspects of the special education school and life in the surrounding community of Cuernavaca, Mexico. Participant-observation and interviewing (Glesne, 1999) are the primary forms of data collection for this study.

Observations. Observation roles fall on a continuum of interaction between the researcher and the research participants (Glesne, 1999). In this study, the researcher’s roles fluctuated from being participant to participant-observer, as allowed in each observation situation. Observations included lunchtime when students and staff were eating and the outside basketball court during the lunch break. The researcher often ate lunch with the other staff members on the outside court and discussed topics of
the day or solicited specific information about the school. Observations also included several classrooms, which included noting the physical environment and the number of students, interactions among the teachers and students, and curricular choices and instructional methods. Other informal observations occurred as I moved about the community in my daily life.

**Interviews.** Informal, semi-structured interviews were conducted of parents, teachers, administrators and local community members connected to one public special education school. Thirty-four interviews, approximately 30 minutes to 1 1/2 hours long, were conducted in Spanish. Each interview began with the reiteration that participation was voluntary, a review of the purpose of the study, and an icebreaker (e.g., tell me about your family). Then, an initial global question about transition was posed, for example, *What will your child do when he or she leaves this school?* Individual questions on the interview protocol were determined by the content of the interviewee’s response.

Data collection continued until such time as the information being mined no longer added new angles to the overall picture and the analytic categories had been firmly established (Miller, 1995). Although data analysis is ongoing, the final stages of data analysis began once I left the field.

**Data Analysis**

Data analysis occurred simultaneously with the data collection procedures in the field (Glesne, 1999; Fetterman, 1989). Using the constant comparative method and coding, categories were constructed as data became available (Merriam, 1998). Coding included using three interrelated levels (open coding, axial coding, and selective coding) and assisted in identifying and describing the patterns and meanings from the data (Charmaz, 2000).

During open coding I broke the data into concepts and categories, and identifying the nature of the concepts and the relationships the concepts had with one another. As each interview transcript was read I gave labels to the concepts that were emerging. As concepts began to cluster into groups, I moved on to the second level of coding, axial coding (Strauss & Corbin, 1998), re-assembling the coded data into groups of interrelated labels or concepts (categories), identifying connections between categories and any sub-categories. With selective coding, I organized the categories into a large, integrated scheme by identifying the central or core theme (Charmaz, 2000): the intersection between adulthood and disability in Cuernavaca, Mexico. Within the intersection of adulthood and disability in Cuernavaca, Mexico, I included the concept of adulthood in general, the concept of adulthood with a disability, and the community response to adults with disabilities.

**Trustworthiness, Accuracy and Credibility**

Thorough and careful analysis of ethnographic data, the use of triangulation, pattern development, and key events can lead to greater accuracy, credibility, and trustworthiness in analysis of the data from the field (Denzin & Lincoln, 2005; Toma, 2006). In this study, I used prolonged field engagement, theoretical sampling, persistent observation, triangulation [*the combination of multiple methodological practices, empirical materials, perspectives and observers* (Denzin & Lincoln, 2005, p. 5)], and the identification of key events to enhance the accuracy and truthfulness of the (Denzin & Lincoln, 2005; Janesick, 1994; Morse, 1994).

In addition to the above activities, at the end of formal data collection, I conducted debriefing meetings. While targeted mostly at data analysis, these meetings yielded additional data that improved my understanding of the phenomena under study. While still in Mexico, the author, a fellow American citizen, and a bilingual secretary conducted two debriefing meetings after all of the interviews and transcripts were completed. Having been born in Cuernavaca, the secretary who transcribed the interview recordings was the natural choice to debrief with as I sought to increase my understanding of and coherence in the translations (both literal and cultural). Transcripts from each of the constituent groups’ interviews (parents, schools, and community members) were read for the first meeting. The second meeting focused on the transcripts from family members only. During each meeting, we reflected on the subject matter and, especially on the part of the native born Mexican secretary, offered general impressions of the treatment and education of people with disabilities in Cuernavaca, Mexico. Finally, although the goal of this ethnographic case study was to provide a thick description of transition to adult life for students with disabilities in one Mexican school-community and adult life for persons with disabilities in the surrounding community, it tells the story of this community only. As such, I do not claim to provide readily transferable information.
Limitations
Careful consideration was given during the overall design of this study in an attempt to address possible limitations. However, it was impossible to anticipate or control all aspects of this study. Hence, there are some limitations.

Geography is a limitation in this study. The study was conducted in a large urban city named Cuernavaca in the central Mexican state of Morelos. As such, while I have every reason to believe that many of these results would be applicable in other parts of Mexico, I would caution the reader to be discriminating in applying the results in other regions and with other populations.

Another limitation is the researcher as an instrument of data collection. The researcher was responsible for conducting interviews, interpreting data, and making conclusions. Although many steps were taken to ensure the validity of the results (e.g., debriefings with native Mexican Spanish speakers, multiple data sources), my status as a white US citizen should be considered a limitation of this study.

Results and Discussion
Contemporary life in Cuernavaca, Mexico, is characterized by wide-ranging experiences involving foreigners (extranjeros) who come to study at the many foreign language schools. Citizens of the state of Morelos, where Cuernavaca is located, enjoy many of the cutting edge technologies found in other parts of the world. Cell phones can be heard ringing and most middle class families have either cable or satellite television, with an increasing amount of homes having high-speed internet, at their disposal. Unfortunately, not all members of the community enjoy this lifestyle. With this backdrop of modernity and vibrant rhythms of progress and technology one needs only to look slightly beneath the surface to see another, very different side of Cuernavaca.

Daily life (la vida cotidiana) for many is marked by high levels of unemployment and poverty. Highly defined gender, social, and family relationships are another constant. Difficult financial and social situations are further complicated by government corruption and low levels of public funding for projects such as schools and job creation, serious issues frequently discussed by the citizenry. In short, the daily lives of most of the adults in Cuernavaca, Morelos, are consumed with survival – finding the next meal, paying the rent, and making sure they are taking care of their families’ welfare. For adults with disabilities in Cuernavaca these difficulties are exacerbated exponentially in contemporary society. Understanding the challenges faced by these adults requires an understanding of the lives of adults without disabilities along with an understanding of the lives of adult with disabilities. Each of these is addressed below. In addition, we offer an explanatory framework that appears to ground the beliefs that under-gird the cultural practices and beliefs identified in this study. Finally, we conclude with implications for practice and suggestions for future research.

Adulthood in Cuernavaca
Participants described their conception of adulthood. They told me that adulthood in this community is marked by many roles and responsibilities; working, creating a family, helping out the family of origin, and being a contributing citizen of the United States of Mexico (estados unidos mexicanos). Adults are expected to seek and maintain employment or make every effort to do so. Although high levels of unemployment, suffocating corruption, and high levels of migration to the United States undermine this expectancy, the employment expectation persists.

Participants also reported that in Cuernavaca employment for adults is rarely referred to as permanent or stable. For many, this lack of permanency/stability of work is true regardless of their education or income level. The university-trained professional in Mexico can just as likely be employed as a taxi driver or bus driver than as a practicing lawyer. Meanwhile, the unskilled worker is busily searching for a job in which he can make enough money to make ends meet. These economic conditions can be further exacerbated by the firmly entrenched gender roles that still exist in Cuernavaca today that I discuss in the next section.

Male and female gender roles have changed very little over time in Mexican culture. Normally, the man is responsible for giving the family money and the mother is one that takes care of the house and children (Ernesto, community member). As described by Ernesto, women are in charge of the family, children, and the needs for the schools. Males are in charge of making major decisions involving the family. Those decisions include how much allowance (Domingo) to give the woman each week. When Conchita, a
mother with a child with disability, was asked by the researcher why her husband and other men think the way they do she said the following:

It’s the machismo and they think we (women) are inferior. They think that whatever wrong thing that happens, it’s the woman’s fault.

She went on to say with regard to having children with disabilities:

The fathers blame the mothers and think it’s our fault when a child with a disability is born.

Gender roles are further reinforced in the corruption of the good old boy networks in government, which are dominated by men in positions of power and influence.

Corruption in Mexico at all levels of government is as famous as the pyramids of the sun and the moon at the site of Teotihuacan. Marches and demonstrations (manifestaciones) can be heard on most days in the capital city of Morelos. These protesting groups are diverse, each one asking the government to make good on promises made through formal or informal agreements. Everyone knows about the scourge of corruption, In Mexico we have corruption; that is undeniable (Lourdes). Yet another community informant, Consuelo, went into more specific detail about a scenario (that further complicates the issue of social reproduction of disability) in which a person in Mexico may secure employment. The dialogue begins with the researcher’s question:

Q: If you know me even though I have a disability, you would offer me a job?

Consuelo: If you are my friend and I like you, yes I’m going to help you. If I don’t know you, no I’m not going to help you.

They openly talk about corruption in cafes and other public places as well as in our participant interviews. Unfortunately, it appears to be very difficult to change the culture of favors, connections, and gift giving.

While there is no pressure to move out and/or begin a family at any magical age, Mexicans expect this to happen eventually; meaning each non-disabled man and woman in Mexico will eventually experience the passage into adulthood. However, crossing the threshold into adulthood does not necessarily equate with establishing a separate household. Adults who marry may choose to live with the parents of either spouse and sometimes continue this living arrangement after they begin having children. Cross-generational households also occur, when couples, previously lived independently, move in with grandparents. These types of living arrangements are seen as mutually beneficial. The families of origin and their offspring benefit from pooling their resources, increasing their capacity for amassing economic capital. In fact, the author knows of one case where the son (in his mid-20s) has already finished law school and is living at home to help with the family responsibilities, but he also must live with the family to create the financial basis from which to begin to build his client base.

Finally, adults in Mexican society are expected to be productive citizens. This productivity implies many things including employment and public service, which gives back to society. In fact, several participants mentioned that their professions required them, upon completion of their university degrees, to provide unpaid service to disadvantaged communities. Ironically, this expectation seemed to imply that citizens who finished their college careers were valuable and had something to give back to society. There was no mention of similar expectations for people who had completed their secondary or primary educational programs as their terminal degrees.

Adulthood for Persons with Disabilities in Morelos, México

Adulthood for people with disabilities in Cuernavaca is marked by societal rejection, low employment expectations and no independent living options. Mexicans achieve legal adulthood when they reach the age of 18. Legal adulthood in Mexico means the ability to vote and, as in the case of males, eligibility for the military draft lottery. Unfortunately, there are no advocacy or adult services, and in Cuernavaca there appears to be a pervasive belief that persons with disabilities will never be adults. Consequently, there are no systems or pressures external to the family to assure that adults with disabilities are being afforded their rights to engage society as citizens. Unless individual families push to assert and maintain the
citizenship and civil rights and responsibilities of the adult with a disability, these rights and responsibilities seem to disappear. As a result, persons with disabilities have no civil right to access or participate in community settings or services and opportunities, from employment to recreation. Employers, vendors, bus drivers, etc. may refuse to hire or interact with people with disabilities without fear of legal or social repercussions.

Beginning with their families, youth and adults with disabilities are framed within the context of myth and fear. Participants indicated that families often believe in folklore or old wives tales about people with disabilities. Reactions include denial of having a child with a disability carrying through to the belief that adults with disabilities cannot work or function without supervision. These beliefs pose limits to the possibility that the child with a disability will have the opportunities needed to reach his/her potential. In Cuernavaca, families with adolescents with disabilities have no expectations for employment, moving out, increased independence, or even finishing formal schooling. Thus, parental concern about independence relates more to whether or not a child with a disability will ever reach the level of personal independence that will make their care less onerous. As a community respondent remarked:

Normally, the mother is responsible for the care of the child with a disability or older siblings take care of the child with problems. But there is no sense that they will create an independent child. Children (with disabilities) are very dependent on some adult and the family (they) have to work (together). Sometimes, the older siblings have to work with the mother and distribute the time amongst themselves.

In an attempt to maintain stability in family functioning, Mexican families often seek to keep the adult with a disability in the schooling experience as long as possible. For this reason respondents discussed many cases of adults with disabilities well into age 20, 30, and 40 still in school settings. This was not seen as problematic. Rather, in this culture, the gravest situation would be losing the only apparent adult service lifeline available to adults with disabilities in this part of Mexico.

Societal rejection was real and obvious. It took many forms and included social rejection on public busses or not being allowed to stay in a movie until its conclusion. Ana described riding the bus (la ruta) with her child with a disability. She reported that she and her child were first given strange looks by the other passengers. Then, they would not move over to allow her to sit down even though there was plenty of room. She went on to say:

Then I would just take him to the other side (of the bus) to avoid having to argue with people. Sometimes, kids (on the bus) attack him with their words or hit him.

José, a professional in the field of disabilities in Cuernavaca, described similar incidents. The first was when José took a student to the grocery store. At the store they encountered a woman who was so afraid of the child with disability that said something might happen to her. He went on to report:

We took him (the child with a disability) to the supermarket and a woman was there and she was upset and I had to say to the lady what was happening and that he was a special child and need more time and space to attend to him. The woman got very mad.

Rejection is based, in part, on the fact that adults with disabilities are seen as a burden to society. According to informants, in Cuernavaca (and quite probably in Mexico in general), if a person isn’t viewed as contributing to society, he or she is viewed as subtracting from the society. Adults with disabilities are seen as taking the most away from society because of the perception that they can never be contributing members of the society.

Being a non-contributing member is the result of being unable to fill adult roles associated with gender-based expectations, especially in the area of employment. Low employment expectations originate from the societal belief that adults (or students) with disabilities are not capable of work. Even if adults with disabilities had proper vocational training, there are simply no employment options in the community – except for a few, rare exceptions. As Susana (a community member) stated:

Mexico is a very poor country and the employment opportunities are directed to persons without disabilities. Because to employ a person with a disability means that they (the factory)
have to dedicate time to their training……but in reality the companies are trying to survive because of the economic problems of the country.

The above descriptions for adults with disabilities in Cuernavaca seem to suggest that there is little being attempted to try to ameliorate these difficult issues. This impression would be inaccurate; there are many advocates working on behalf of adults with disabilities in Cuernavaca. However, there are also many obstacles in the way of the self-actualization of adults with disabilities in Mexico, and most of these are outside of the immediate control of many of the constituent groups working to improve the lives of people with disabilities (e.g., lack of publicly funded programs and services). Corruption in Cuernavaca siphons off the resources needed for adults with disabilities. This funding is redirected towards other projects, or the funds simply go missing (understood by the average citizen as equating with stolen). Consequently, efforts to improve the lives of people with disabilities, beyond basic education, are dependent on fund raising efforts by private individuals and groups.

A Framework for Understanding Adulthood for People with Disabilities in Cuernavaca, Morelos

The lives of adults with disabilities in Cuernavaca can be better understood if one considers the relative roles they play in that culture. In his seminal book, Normalization, Wolfensberger (1972) described eight historical roles for or views of people with disabilities: subhuman organism, menace, unspeakable object of dread, object of pity, holy innocent, diseased organism, object of ridicule, eternal child. These historic roles for or views of people with disabilities seem to have particular relevance when attempting to understand the position of adults with disabilities in Cuernavaca, Mexico. Thus, what may look like dated descriptors and subsequent recommendations for practice are still relevant today in Mexico and beyond.

Three of these roles are particularly relevant to the status of adults with disabilities in Cuernavaca (i.e., eternal child, holy innocent, and object of pity). Consequently, in this section they are addressed individually. A discussion of the remaining roles and a section summary conclude this section.

Eternal child. In Cuernavaca, most adult children will leave and begin to build a life separate from their family of origin when they are in their mid 20s or mid 30s, and/or they will marry. Children with disabilities are never expected to leave their family of origin and forge an independent life of their own, there is no sense that they will create an independent child (Anita). Regardless of their level of disability, and despite the many independence skills most of them acquire, they are never viewed as wholly capable of meeting all of their needs or taking care of typical adult responsibilities. When the parents of adults with disabilities die or become too ill to care for their child with a disability, care for that child shifts to their adult siblings. As Anita stated, Normally, the mother is responsible for the care of the child with a disability or older siblings take care of the child with problems. Thus, they are viewed as always being in need of care taking. Furthermore, family members provide young adults and adults with disabilities with extra protection. Participants indicated that they fear that disabled adults will be taken advantage of, made fun of, or otherwise abused, so they keep these defenseless individual hidden away from the rest of the world, not allowing them to take the risks normally associated with adulthood (Nirje, 1972). As a result, the role of child is never finished for the person with a disability Mexico.

Holy innocent. Not only are adults with disabilities seen as eternal children, their lives are seen as representing a message from God. This attribution was commonly made by many of the residents in Cuernavaca in that they frequently referred to people with disabilities as being sent from God for a positive purpose; but, when pressed, they could not identify what that purpose was. The belief was also stated in family views, although its presence was not as prevalent as one might think in a country such as Mexico, with most of its population claiming to be Catholic. Informants who described beliefs that associated the presence of disability with an intention by God tended to be people from lower socio-economic statuses (de bajos recursos); families from higher socio-economic statuses were more likely to attribute disability to scientific factors rather than religious factors. Families that reported their belief in a religious connection went through various stages — initially attributing the presence of the child as a punishment (un castigo) but later believing that their child was sent by God as an angel or to teach them to live their lives in a more Christian-like manner (e.g., demonstrating greater compassion or patience).

In addition to needing perpetual care and protection, people with disabilities were treated differently and, at times, not held accountable for their behavior. In other words, when a person with a disability would do something socially unacceptable, the innocence and childishness associated with the disability would
be the justification. Instead of acknowledging the fact that individuals with disabilities are fallible human beings who make errors or intentionally behave in inappropriate ways, these individuals were excused from learning and adhering to the social expectations and mores applicable to their non-disabled peers. As a result, few attempts were made to improve social behaviors, and inappropriate but remediable behaviors were allowed to continue. Allowing the continuation of aberrant or unacceptable behavior highlights the deviance of some people with disabilities and confirms already established biases about the nature of disabilities. Consequences from confirming these biases can vary from pity, devaluation, and social isolation to overt action against the person resulting in victimization (e.g., via violent or fraudulent interactions) or advocating for the complete physical isolation of people with disabilities from the rest of the community (e.g., institutionalization).

Object of pity. Pity is so common in the State of Morelos that the motto for the state of Morelos department of special education is accept me as I am for reasons of justice not of pity (acceptame como soy en razón de justicia y no de piedad). The depth of this sentiment is difficult to describe without experiencing it first hand. However, as the author was living in the community and talking with various people (taxi drivers, store attendants, waiters, etc.), he was greeted many times with statements like, Oh, you are working with those people? Those poor things - to be born that way. Do they have schools? Oh good, well they definitely need help. I'm glad you are here to help them. Characterizing someone as an object of pity interferes with identifying that individual’s strength and potential. Assisting adults with disabilities to exercise their rights as Mexican citizens or to become employees requires educators and service providers to ensure that non-disabled people see the potential and competence of people with disabilities, not objects of pity.

Other roles. Some informants expressed fear or unease with people with disabilities or related stories that suggested uninformed community members were uneasy or fearful of persons with disabilities. For example, José, a professional in the field of disabilities in Cuernavaca, took a student to the grocery store. At the store they encountered a woman who was afraid of the child with disability because she thought something might happen to her. The data from this research cannot specifically identify the source of this fear or unease. However, historic roles reveal other potential sources for these feelings.

One source is the characterization of the person with a disability as an unspeakable object of dread because the person with a disability is seen as having been sent by God as a direct punishment for the sins of the parents or because the person is seen as a representation of dreadful entity or event, e.g., a reminder of how fragile human life is (Wolfensberger, 1972). Although often associated with pity, viewing a person as an object of dread typically moves that pity to fear and rejection. Ana described riding the bus (la ruta) with her child with a disability. She reported that she and her child were first given strange looks by the other passengers. Then, they wouldn’t move over to allow her to sit down even though there was plenty of room. I would just take him to the other side (of the bus) to avoid having to argue with people. Sometimes, kids (on the bus) attack him with their words or hit him (Ana). Other incidents included bus drivers in Cuernavaca refusing to pick up people with disabilities or moviegoers asking to have a child with a disability removed from the theater for making some noises. These behaviors may also reflect the belief that the person with a disability is a diseased organism (and possibly contagious).

The diseased organism role describes people with disabilities as people who are sick and who must be cured if they are to move beyond their sickness. At the beginning of this study’s fieldwork, it surprised me how frequently people would refer to people with disabilities as being sick (enfermo). This way of describing people with disabilities was so common in the Cuernavacan culture that after spending significant time in the field, I began to take less note of its mention. The other way people would assign the sick label to people with disabilities would be when parents compared other children to their child with a disability. In these cases, parents would describe children without a disability as being born healthy (sano). Although associating illness or disease with the individual with a disability was not done in a pejorative manner, such associations affected services and outcome expectations for these individuals. If the child with a disability could never be cured, then that child would always continue in his or her diseased status and would need continuing care and protection. Furthermore, if the individual with a disability was seen as diseased, it is possible that the disease could be communicated to those who come into contact with the diseased person. Thus, the disease characterization may inspire rejection and fear, although these feelings may be more benign than if the individual with a disability is seen as a menace.
Summary. Many Mexicans, living in this region of central México, have not reached even a minimal level of understanding of the causes or affects of disability, or the potential of people with disabilities. Consequently, they have not begun to accept people with disabilities. This lack of understanding emerged in interview after interview; with respondents indicating that they thought people with disabilities are treated poorly because most people don’t understand them (falta de información). They also said that because the general population doesn’t understand people with disabilities, people generally feared individuals with disabilities. Because of the fear, rejection, and erroneous beliefs inspired by the presence of disability, persons with disabilities are cast into powerless positions. Furthermore, their families were forced to deal with negative biases, unfavorable characterizations, and real, and imagined, threats to the emotional and physical safety of their loved ones with disabilities. These affects were felt across socio-economic and educational levels.

Implications for Practice
People with disabilities in the region of México reported in this investigation are viewed, mostly as eternal children. This belief is reified by parental and school practices that do not include teaching independent living, social, vocational, and other survival skills to children and adolescents who have disabilities. If students with disabilities were taught the necessary skills to engage society as fully included adults, having all of the rights and responsibilities of any adult in México, Cuernavacans might begin to understand the capabilities and potential of people with disabilities. Furthermore, in this region, many individuals with disabilities are isolated from the rest of their communities. Without positive, productive contact, these individuals will never be able to garner the social capital needed to influence the course of their lives.

Enhancing the chances of adults with disabilities to access adult life in Mexico will require significant changes in Mexican schools, including changes to their educational philosophies, curriculum content, educational delivery methods, and settings to ensure that students with disabilities have the opportunities to acquire critical skills. For example, teaching community valued skills would help parents and community members begin to have higher expectations for the adult lives of persons with disabilities. Teaching these skills in appropriate settings, using appropriate assessment and training techniques, and providing needed adaptations and accommodations will further enhance the chances that students with disabilities will successfully acquire critical skills and be able to use and maintain them in community settings.

To implement changes, philosophical changes need to be considered by Mexican special educators and family members. Currently, children and adults with disabilities by and large live in highly restrictive, protective settings. Unfortunately, such settings prevent these individuals from ever achieving their own individual dignity, as described by Nirje (1972). If children with disabilities are to become adults, risks, in the form of real life experiences can and should be afforded to them to prepare them for their adult lives. Educators and parents will need the courage to try low-risk tasks at first, and then the courage to increase their tolerance for risk as the developing child with a disability increases their competence.

Suggestions for Future Research
During the course of this study, there were several issues that arose which were out of the scope (funnel) of this study or, because of time limitations, were unable to be explored in depth. One of these issues could shed additional light on the understanding of the topic targeted for this research: business and professionals perspective on hiring people with disabilities. Why do employers choose not to hire people with disabilities? Although this question was asked, and this study began to explain some of the biases, the results of this study are insufficient to understand employer beliefs and biases. Only one employer was available for an interview. I was fortunate to find even one employer to interview given that lack of employment opportunities for adults with disabilities in the workforce in Cuernavaca. Consequently, I can only speculate the employers worried about financial implications. I also believe that the society as a whole is not accepting of people with disabilities so it fits that employers would mirror the feelings of the overall culture, or it may be that employers have never considered adults with disabilities as potential employees. I would also like to see researchers begin to look at the social construction of disability through a Disability Studies in Education (DSE) theoretical framework. Data garnered from a DSE line of inquiry in México would be very beneficial from a political and public policy standpoint.
Conclusions

Early in the twenty-first century Cuernavaca, Morelos is a society that is still trying to find a place for their adult citizens with disabilities. Many Cuernavacans hold stereotypical beliefs about people with disabilities grounded in superstition and ignorance. They believe that they are sick or crazy and might be contagious. The problems that arise from these erroneous beliefs are compounded by affects of corruption within the Mexican government. With blatant stealing of funds from schools to the buying and selling of teacher contracts, schools for students with disabilities struggle to keep their heads above water. High levels of unemployment may also contribute to the lack of or willingness to understand people with disabilities. With average adults in Cuernavaca working multiple jobs trying to meet the basic needs of their families, there appears to be little room for employment of people with disabilities.

Schools, families, and some members of the community are attempting to change existing conditions. They are trying bridge the gap in services that results from those services not being provided by the government. By providing their own adult services for people with disabilities, these stakeholders hope to supplement existing services. Some schools for people with disabilities offer vocational workshops (sheltered workshops) and other training to adolescents and adults in hopes that they can acquire skills that could be successfully put to use in the community in the open job market. Unfortunately, the prospects of such competitive employment remain slim to none.

References


ESTABLISHING THE RELATIVE IMPORTANCE OF APPLYING GRAY’S SENTENCE RATIO AS A COMPONENT IN A 10-STEP SOCIAL STORIES INTERVENTION MODEL FOR STUDENTS WITH ASD

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Literature on Social Stories cautions that there is little empirical evidence for their effectiveness. Researchers have called for further investigations to determine the components of Social Stories intervention packages that contribute to their efficacy. Gray has introduced a ratio of sentence types to be used in Social Stories. The present study seeks to investigate if Gray’s recommended sentence ratio is an essential component of Social Stories. For this purpose, a 10-Step Social Stories intervention model using Gray’s sentence ratio (i.e., a ‘contextual’ Social Story), and one omitting Gray’s sentence ratio (i.e., a ‘directive’ Social Story), was compared in teaching social skills to students with ASD. Contextual Social Stories consistently yielded fewer trials to criterion and maintained stable performance at criterion.

Introduction

Social Stories as an Instructional Strategy for Autism Spectrum Disorders

Social skills deficits represent an essential part of the diagnostic picture of autism spectrum disorders (ASD) or pervasive developmental disorders (PDD) in the DSM-IV-R (Diagnostic and statistical manual of mental disorders by the American Psychiatric Association, text revision 1996). The majority of individuals with autism have either a limited interest in reciprocal social interactions, or they may have an interest in interacting with others but lack the necessary skills to do so effectively (Szatmari, Bartolucci, Bremmer, Bond, & Rich, 1989). Social skills are among the most complex, but also the most important, behaviors to learn because they have a great impact on an individual’s social engagement and quality of life; thus, social skills training constitutes an important aspect of working with individuals with ASD/PDD (Neisworth & Wolfe, 2005; Chadsey-Rusch, 1992). One particular instructional tool for teaching social skills to students with autism is an intervention called Social Stories.

A Social Story is a short story, defined by specific characteristics, that describes a situation, concept, or social skill using a format that is meaningful for individuals with ASD (Reynhout & Carter, 2006). Originally, Social Stories were developed by Gray (1995) to teach children with autism how to play recreational games while increasing their ability to interact socially with others (Quill, 1995). They have been used with a focus on diverse social skills in the instruction of children with varying degrees of severity of ASD (Barry & Burlew, 2004; Reynhout & Carter, 2006). Gray and White (2002) have published a book with many sample Social Stories for practitioners that covers various topics including self-care, playing at home and going places; however, these samples do not include empirical information on implementation of such Social Stories. Reviewers of Social Story literature (Barry & Burlew, 2004; Reynhout & Carter, 2006; Sansosti, Powell-Smith, & Kincaid, 2004; Tarnai, Wolfe, Rusch, & Lee, 2009) identified about 30 published studies in which Social Stories have been implemented and have reported that behavioral targets included both aims to decrease socially disruptive or challenging behaviors (e.g., using loud voice, dropping to floor for tantrum, spilling food/drink) and to increase social interaction or communicative behaviors (e.g., napkin use, sharing toys, greeting).

Gray (1995) emphasized that Social Stories are intended to describe more than direct behavior, thus, Social Stories are differentiated from instructional techniques such as task analyses. To ensure a descriptive framework, Gray introduced a ratio of specific sentence types (Table 1) to be used in a Social Story (i.e., two to five descriptive, perspective, and/or affirmative sentences for every directive and/or
control sentence). Reviews of the literature (Barry & Burlew, 2004; Reynhout & Carter, 2006; Sansosti et al., 2004; Tarnai et al., 2009) have revealed that Social Story implementations do not systematically adhere to Gray’s sentence ratio.

### Table 1. Basic Sentence Types Used in Social Stories

<table>
<thead>
<tr>
<th>Sentence Type</th>
<th>Definition</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Descriptive</td>
<td>Describes the social situation in terms of relevant social cues.</td>
<td>In the morning, when it is time for me to get up and get dressed, Mom or Dad lays out clothes for me onto the bench at the end of my bed.</td>
</tr>
<tr>
<td>Directive</td>
<td>Describes an appropriate behavioral response.</td>
<td>When I get up and out of bed, I have to take off my pajamas and put on the clothes that my Mom or Dad laid out for me.</td>
</tr>
<tr>
<td>Perspective</td>
<td>Describes the feelings and/or responses of the student OR others in the situation.</td>
<td>If I get dressed properly and in time, my parents will not be nervous and worried that I may be late for catching the school bus.</td>
</tr>
<tr>
<td>Affirmative</td>
<td>Expresses a commonly shared value or opinion within a given culture.</td>
<td>Because parents are busy in the morning with preparing breakfast for the family and getting ready for going to work, it is nice to help them by getting dressed independently and save time for them to finish their jobs.</td>
</tr>
<tr>
<td>Control</td>
<td>Written by a person with ASD to identify personal strategies to recall and use.</td>
<td>When I see Mom or Dad in the morning laying out clothes on the bench at the end of my bed for me to wear, I will get out of bed, take off my pajamas and put on those clothes.</td>
</tr>
<tr>
<td>Cooperative</td>
<td>Describes what others will do to assist the student.</td>
<td>If I need help with buttons or zippers, I can tell Mom or Dad “please help me”, show what I could not do on my own and they will help me do it.</td>
</tr>
</tbody>
</table>

Note. *Definitions are based on the literature review by Reynhout and Carter (2006).*

Reynhout and Carter’s review of the literature (2006) points out that Gray’s (1995; 2003) recommendations for story construction were not based on empirical evidence. Reynhout and Carter (2006) conclude that because of a high degree of procedural variation among their reviewed studies, and additional issues of treatment fidelity, no sufficient experimental control was established to ascertain solid empirically based findings related to the efficacy of Social Stories; incl. variations of Gray’s sentence ratio. Although studies reviewed by Tarnai et al. (2009) have reported some positive outcomes (e.g., Bledose, Myles, & Simpson, 2003; Brownell, 2002; Hagiwara & Myles, 1999; Kuoch & Mirenda, 2003; Kuttler, Myles, & Carlson, 1998; Lorimer, Simpson, Myles, & Ganz, 2002; Scattone, Wilczynski, Edwards, & Rabin, 2002; Scattone, Tingstrom, & Wilczynski 2006; Swaggart, Gagnon, Bock, Earles, Quinn, Myles, & Simpson, 1995), such positive outcomes were not linked to certain procedural variations in Social Stories. As Tarnai et al. (2009) note, because component variables were not systematically manipulated across replicated interventions, effective components were not isolated, hence, not distinguishable.

Thus, the central issue identified by reviewers of Social Story interventions (Barry & Burlew, 2004; Reynhout & Carter, 2006; Tarnai et al., 2009) is the lack of a consistent research base that would make Social Story interventions comparable along the components of intervention packages. At present, because so many Social Story components are varied at the same time, a comparative component analysis is not possible and the relative necessity of individual intervention components cannot be established. However, a component analysis would be desirable to establish an empirical basis for Social Stories and to guide practitioners in implementing Social Stories in the most efficient manner. Without a component analysis, it is not possible to ascertain whether Gray’s (1995; 2003) specific
recommendations for constructing Social Stories (i.e., her sentence ratio) are necessary or whether other instructional components can achieve the same effect (with a possibly less complicated intervention, since applying Gray’s sentence ratio for constructing a text requires careful adherence to specific guidelines). An answer to this question is needed because for over a decade, Social Stories have been, and continue to be, applied (Barry & Burlew, 2004; Reynhout & Carter, 2006) without a common framework and without empirical evidence of their relative efficacy in practical implementation.

Quirmbach, Lincoln, Feinberg-Gizzo, Ingersoll, and Andrews (2009) compared two formats of a social story to a control condition, using a pretest posttest repeated measures randomized control group design with 45 children diagnosed with ASD. The standard and directive stories were equally effective (over the control condition) in eliciting improvements in game play, and the children in the standard and directive groups continued to demonstrate appropriate game play skills across trials, and maintained their skills one week after receiving the intervention. Here, the ‘standard’ story included the same directive sentences as the ‘directive’ format. Thus, as the authors observe, their study provided strong empirical evidence mainly for the efficiency of social stories as such, yet it did not represent a thorough component analysis.

A partial component analysis was attempted by Okada, Ohtake, and Yanagihara (2008), investigating the impact of manipulating the value of perspective sentences. Three types of perspective sentences (sentences held by unknown persons, those held by familiar persons, and those held by the most preferred person) were alternately added to a Social Story to determine which perspective sentences were the most effective in improving the student's head and elbow positions during sitting at morning circle and lunch. Results indicated that the effectiveness of a Social Story did not seem to depend on whose perspectives the story used. Findings suggest that depicting only the perspectives of the most preferred person in the story may not be sufficiently powerful to change behaviours. These findings support Gray’s intuitive position on the need for adding broader social-contextual information to directive training but still do not provide for detailed component analysis of social stories.

In response to the lack of a component analysis, Tarnai et al., (2009) reviewed and analyzed Social Stories interventions for individuals with ASD to identify typically reported elements of intervention packages, in order to establish an empirical basis for comparison, so that systematic experimental manipulations could be introduced. Based on the review, a 10-step model Social Stories intervention package (Table 2) was developed and implemented in a pilot study to test whether the isolated core components constituted an effective Social Story intervention. Procedural fidelity was established, and the Social Story implementations resulted in attainment of behavioral goals by six individuals with ASD. These goals included reducing inappropriate social behaviors such as hitting for attention, stigmatizing vocalizations, indecent scratching or self-exposure in public; and increasing social interaction and initiation within an applied social skills training setting.

**Purpose of the Present Study**

The present study builds on the framework of the 10-step approach from the Tarnai et al. (2009) study that established a basis of comparison for systematic modifications within a Social Stories intervention package. Specifically, the study examines if Gray’s sentence ratio is an essential component of Social Stories interventions to attain positive outcomes on social skills for individuals with ASD. For this purpose, a 10-Step Social Stories intervention model including Gray’s sentence ratio (i.e., a ‘contextual’ Social Story), and a similarly composed model omitting Gray’s sentence ratio (i.e., a ‘directive’ Social Story), is compared in teaching social skills to students with ASD. Other intervention components (Tarnai et al., 2009) will be kept constant.

Research questions include: (a) Is there a difference between a contextual Social Story intervention package including Gray’s sentence ratio, and a directive Social Story intervention omitting Gray’s sentence ratio, for teaching table setting for friends to students with ASD, on performance measured by percentage of criterion attained (based on pre-defined task analysis steps)?; and (b) Is there a difference between a contextual Social Story intervention package including Gray’s sentence ratio, and a directive Social Story intervention omitting Gray’s sentence ratio, teaching table setting for friends to students with ASD, on performance measured by number of necessary trials to criterion?

In addition to these primary dependent measures, (c) an ancillary measure to assess response generalization is also included. Specifically, the placement of an additional utensil (i.e., napkin) not
included in the Social Stories for table setting will be recorded during baseline and intervention; to explore the possibility of generalization-across-behaviors of the social-contextual message of the contextual Social Story version (i.e., adhering to Gray’s sentence ratio) that emphasizes the advantages of the predictability of a certain place setting.

Table 2. Tarnai’s 10-Step Approach to Constructing and Evaluating Social Stories
(Based on Tarnai et al., 2009.)

<table>
<thead>
<tr>
<th>Task Steps</th>
<th>Strategies</th>
<th>Outcomes</th>
<th>Evaluation*</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) Identify behavior in need of change</td>
<td>Improvements in this behavior should likely lead to increased function of adaptive behavior(s), social functioning, or safety and defined</td>
<td>Behavior improvement</td>
<td>-----</td>
</tr>
<tr>
<td>2) Identify target social skill for instruction</td>
<td>The social skill (alternative behavior) chosen for instruction should increase social competence (i.e., skills functional for the student) behavior(s)</td>
<td>Target skill (alternative behavior(s))</td>
<td>-----</td>
</tr>
<tr>
<td>3) Collect baseline data</td>
<td>Observe and record the occurrence of targeted non-desirable behavior(s) and/or desired (alternative) behavior(s).</td>
<td>Recorded and graphed baseline data</td>
<td>-----</td>
</tr>
<tr>
<td>4) Create Social Story</td>
<td>The teacher* writes the Social Story; a) in the first (“I”) and, or third person (“he/she/they”); 2) in present or future tense; 3) at the comprehension level of the student—use as much student input as possible (echo or comprehension after initial reading); 4) label for implementation the Social Story with a title that quickly relates to the topic; 5) give the story an introduction, body, and conclusion; 6) target behaviors positively (“we” vs. “don’t!”), and use Gray’s sentence ratio...</td>
<td>Personalized and form fitted (e.g.) Social Story easily implemented</td>
<td>-----</td>
</tr>
<tr>
<td>5) Select additional visual cues and materials</td>
<td>a) Select visual cues (e.g., photos, drawings, icons, graphically bulleted schedules); b) set the testing schedule and use cues accordingly;</td>
<td>Visual cues / schedule</td>
<td>-----</td>
</tr>
<tr>
<td>6) Rehearse Social Story</td>
<td>The Social Story should be read prior to the actual situation in which the target behavior will be needed. The social skill and contingencies should be linked to the Social Story.</td>
<td>Accurate story readings</td>
<td>-----</td>
</tr>
<tr>
<td>7) Collect performance data</td>
<td>Observe and record graph performance of the desired target behavior, after the introduction of the Social Story.</td>
<td>Recorded and graphed intervention data</td>
<td>-----</td>
</tr>
<tr>
<td>8) Adapt Social Story</td>
<td>According to changes in the targeted behavior shown by the implementation of the social skill, procedures, or feedback necessary may be necessary to ensure ideal performance.</td>
<td>Reviewed and adapted procedures</td>
<td>-----</td>
</tr>
<tr>
<td>9) Promote generalization</td>
<td>If stable social skill performance reaches the expected criteria in the trained practice situation, establish at least two new settings (general case programming) where the same target skill would be helpful. Adapt procedures and monitor performance.</td>
<td>Reviewed and adapted procedures</td>
<td>-----</td>
</tr>
<tr>
<td>10) Fade Social Story</td>
<td>Gradually and systematically fade out the Social Story (e.g., less frequent readings, gradual reduction of the story length, switching to visual cues like graphically bulleted schedules as reminders, etc.).</td>
<td>Skill is maintained</td>
<td>-----</td>
</tr>
</tbody>
</table>

Note: *This 10-Step overview form may be used to check out steps and add comments for the evaluation of the implementation of a particular Social Story program for another professional who will be working with the student (e.g., a teacher’s aid, or a parent).
Method
Participants/Settings
The study was carried out in collaboration with the ‘Agency Program’ (name altered) of a human service agency in Pennsylvania. The Agency Program is a social skills training program serving approximately 15-20 school-age children per session (age range: 9-13 years) diagnosed with ASD. In the summer, when the study was conducted, the program met four to five times a week for six hours a day. The program included diverse structured and guided activities under the supervision of certified staff.

Participants for the study were selected from the pool of students with ASD attending the Agency Program summer sessions who displayed sufficient language/literacy skills to meaningfully read a personalized Social Story and to successfully answer related comprehension questions. Comprehension checks confirmed the match between participants’ and their story’s reading level, so no expectations of a reading level were pre-established beyond minimal, second-grade ability to read a continuous text, and to answer related comprehension questions with 100% accuracy (explained in detail below, under Implementation).

Identification and Training of Project Staff / Informed Consent
Three staff members of the Agency Program were identified by the program coordinator to participate in the study. The program coordinator and two additional staff members (all holding Master’s degrees in education or psychology), all of them familiar to the children in the Agency Program, read the personalized Social Stories with the six participating students. The principal investigator provided staff training in a small-group format prior to the intervention, introducing the procedures of treatment implementation (i.e., Social Story readings), skill practice routines (i.e., table setting for group snack time), and observation/scoring. The principal investigator also conducted treatment fidelity checks to assure consistency in the implementation (see Reliability/Fidelity below for criteria). Agency staff sent out information and recruitment materials to the parents of children with ASD. Informed consent for participation was obtained in writing from the parents of six potential participants.

Pre-Implementation Procedures
Assessment of potential participants.
Based on parental/staff report and direct observation during baseline performance, participants’ hearing and vision was in the normal range. All participants were able to read (and routinely participated in chronological-age matched grade-level, inclusive classes with peers without disabilities) and used verbal speech for communication. After informed consent was obtained, potential participants were given two formal assessments to determine their eligibility to participate in the study, one instrument related to reading level, and a second instrument related to communication skills: (1) DIBELS reading fluency probes; and (2) the Communication Matrix™ (Rowland, 2004).

As discussed, Social Stories can and should be individualized (Gray, 1995; 2003) for each student’s reading and intellectual skills. Thus, participation criteria for literacy were based and assessed on a minimum, second grade oral reading fluency benchmark for a continuous text for our assessment instrument (1): DIBELS reading fluency probes were created, conducted, and scored according to DIBELS guidelines (Good & Kaminski, 2007). All six potential participants passed the benchmark; and they typically read well at their actual grade level (all attended some inclusive classes; Table 3).

As appropriate reading abilities were the only critical and functional participation skills in the Social Stories intervention, no other (intellectual) characteristics were assessed. Yet, it needs to be stressed that all participants routinely participated in chronological-age matched grade-level, inclusive classes (Table 3); i.e., their academic/intellectual abilities may be expected to be within an average, chronological-age-appropriate range.

For our assessment instrument (2): a communications skills profile was completed using the Communication Matrix™ (Rowland, 2004) that assesses communication abilities via parent/professional interview. The program coordinator of the Agency Program provided the data for completing the profiles of the potential participants. All six participants have scored on Level VII (i.e., language: rule-bound use of symbol system, ordered combinations of two or more symbols according to syntactic conventions; Table 3). Thus, potential participants have demonstrated functional oral communication abilities (as opposed to alternative means of expression). The data provider (the program coordinator of the Agency Program) has observed that although all six participants had the ability to use language (standard
American English) for communication in all tested areas, they typically (as expected with ASD) did not often initiate, or engage in, extensive oral communication in Agency Program sessions as much as they abilities would allow.

Because potential participants were assessed as having adequate reading and verbal communication skills, all six boys were included in the study (no females participated in the Agency Program sessions in the given summer). Information was obtained on age, literacy and communication skills, diagnosis, and school placement of the participants (Table 3).

Table 3. Overview of Participants' Demographics, and Assessment Scores Prior to Social Story Implementations

<table>
<thead>
<tr>
<th>Student Identification</th>
<th>School Type</th>
<th>DIBELS Oral Reading Fluency</th>
<th>Communication Matrix Profile</th>
</tr>
</thead>
<tbody>
<tr>
<td>Matthew 10y Autism</td>
<td>Attends general education school (has completed 4th grade)</td>
<td>ORF beyond 100 words per minute (ORF &gt; 80 signals in risk of the second grade and above level)</td>
<td>116 participants have scored Level VII (Language: Rule-bound use of symbol system. Ordered combinations of two or more symbols according to syntactic conventions) and thus have demonstrated oral communication skills (as opposed to alternative means of expression) in all four main categories of refuse, obtain, social, and information and within all sub-categories.</td>
</tr>
<tr>
<td>Jonathan 11y Autism</td>
<td>Attends general education school (has completed 3rd grade)</td>
<td>ORF beyond 120 words per minute (ORF &gt; 80 signals in risk of the second grade and above level)</td>
<td></td>
</tr>
<tr>
<td>Chris 10y PDD-NOS</td>
<td>Attends general education school (has completed 3rd grade)</td>
<td>ORF beyond 90 words per minute (ORF &gt; 80 signals in risk of the second grade and above level)</td>
<td></td>
</tr>
<tr>
<td>Grant 9y PDD-NOS</td>
<td>Partially attends inclusive school (has completed 4th grade)</td>
<td>ORF beyond 110 words per minute (ORF &gt; 80 signals in risk of the second grade and above level)</td>
<td></td>
</tr>
<tr>
<td>Jimmy 10y PDD-NOS</td>
<td>Attends general education school (has completed 3rd grade)</td>
<td>ORF beyond 120 words per minute (ORF &gt; 80 signals in risk of the second grade and above level)</td>
<td>The score (the program coordinator of the Agency Program) has observed that although all six participants had the skill to use language (standard American English) for communication in all tested areas, they typically (as for ASD) did not often initiate, or engage in, extensive oral communication as much as their abilities would allow.</td>
</tr>
<tr>
<td>Bruce 11y PDD-NOS</td>
<td>Attends general education school (has completed 3rd grade)</td>
<td>ORF beyond 120 words per minute (ORF &gt; 80 signals in risk of the second grade and above level)</td>
<td></td>
</tr>
</tbody>
</table>

Note: *Dependent measures and skill evaluation based on DIBELS Benchmark Goals and Indicators of Risk; retrieved June 23, 2005, from http://www.dibels.uoregon.edu/ (3rd ed.). Portland, OR: Oregon Health Science University. PDD-NOS: pervasive developmental disorder, not otherwise specified.

Identification of dependent measures.

Each participant was taught the skill of formal table setting for their Agency Program peers at snack time either via a contextual or a directive Social Story. For the current study, table courtesies applicable at group snack times were suggested by Agency Program staff because individual servers/other assigned jobs were a routine part of Agency Program sessions (e.g., distributing cups or napkins to peers, wiping shared tables clean). Table setting was selected, defined (setting format based on professional culinary service recommendations by Ridges & Curtis, 2004), and broken down into discrete steps through a task analysis (Appendix A) in collaboration with Agency Program staff.

Student performance was measured on: (a) criterion level (criterion = 100% of the task-analyzed skill steps [Appendix A] performed appropriately); and (b) the number of trials-to-criterion (reaching a consistent/continuous performance of 100% of the task-analyzed skill steps). In addition to these primary dependent measures, (c) the placement of the napkin in the table setting task, even though not included in the Social Stories (Appendix A; B; C), was recorded for all six participants during baseline and intervention. This ancillary dependent measure was added to explore the possibility of response generalization linked to the social-contextual message of the contextual Social Story version about predictability of the place setting: *Is there a reason why this place setting came to be a tradition? If people do things, like setting the table, in a similar way all the time, everybody will learn how this is done. People would find the same set-up when they go to a restaurant or to a friend's house. This way, people will not be surprised, and they will easily find everything they need at the table, right where they learned it should be* (quoted from the contextual Social Story; Appendix C).
In the present study, participants were handed napkins along with the other utensils mentioned in their Social Stories (i.e., plates, cups, forks, knives, and spoons; Appendix A; B; C). Any questions raised by the participants about the placement of the napkin were recorded and were answered with the pre-coded response by staff: Do as you think it would be best.

Definition of independent measures.
To test the efficacy of Gray’s sentence ratio, two versions of the table setting task were developed: a contextual (i.e., including Gray’s sentence ratio; step #4g in Table 2) and a directive (i.e., omitting Gray’s sentence ratio) Social Story text. Thus, the independent measure in the study was instruction in table setting using either a contextual (i.e., including Gray’s sentence ratio) or a directive (i.e., omitting Gray’s sentence ratio) Social Stories intervention package designed according to the Tarnai et al. (2009) 10-step approach (Table 2). The intervention consisted of Agency Program staff reading aloud the participants’ Social Stories with them (in individual staff-student pairs) one time at the beginning of each Agency Program session, with as much active student reading as possible. Comprehension questions were answered after initial reading (100% mastery expected, otherwise the stories would be modified as needed; see in detail below under Implementation).

Because independent performance was expected from the participants during the snack time routine, removed in time from the training (i.e., reading of Social Stories at the beginning of each Agency Program session), even though task-analyzed steps guided both the construction of Social Stories and performance scoring, no prompt hierarchy (e.g., independent performance / verbal / model / physical guidance) was applied during skill practice as would routinely be done in task analysis-guided training (Alberto & Troutman, 2008). In fact, one possible practical advantage of Social Stories in some instructional situations may be that instruction is ‘removed’ from skill practice in the actual settings and from actual expected performance times; thus, the intervention becomes relatively unobtrusive (see social validity ratings; Table 4) and requires low guidance/supervision from the instructor at actual performance times (Scott et al., 2000).

Social Story construction.
The principal investigator and Agency Program staff conducted an ecological inventory and developed task-analyzed steps for the target behavior of table setting for group snack time. Appendix A presents the task analysis of the performance steps that were embedded in the Social Stories. Based on these skills-steps, personalized Social Stories were developed, according to student reading levels; in both the contextual and directive versions (differing only on Gray’s sentence ratio). Adhering to the Tarnai et al. (2009) 10-step approach (Step #4; Table 2), the principal investigator in collaboration with the Agency Program coordinator wrote the basic Social Story text: a) in the first (I) and third person (he/she/they); b) in present and future tense; c) at the comprehension level of the participants (comprehension check questions were prepared for initial reading); d) with a title that quickly related to the topic (i.e., How do I set the table for my friends at Agency Program at snack time?); e) formatted and given an introduction, body, and conclusion; f) with behaviors stated positively (do vs. don’t); and g) with Gray’s sentence ratio – in the contextual Social Story version. Appendix B presents the basic directive Social Story, and Appendix C presents the basic contextual Social Story.

The contextual Social Story constructed for the intervention (Appendix C) intended to maintain Gray’s (1995; 2003) sentence ratio of two to five descriptive, perspective and/or affirmative sentences for every directive and/or control sentence (Table 1). Thus, the adherence to Gray’s sentence ratio (step #4g; Table 2) was only checked for procedural fidelity for the construction of the contextual Social Story. The principal investigator and an expert in communication sciences and disorders independently coded the sentences of the basic story to identify them as either type 1 (descriptive, perspective and/or affirmative sentences) or type 2 (directive and/or control sentence). The ratio of type 1 to type 2 sentences was calculated for the contextual Social Story (Appendix C) by each rater. For an agreement, the ratio had to be between 2.00 and 5.00 as judged by both raters (i.e., Gray recommended using two to five type1 sentences for every type2 sentence; the dividend [# of type1 ÷ # of type2] had to be >2 and <5). Inter-rater agreement was calculated by dividing the number of agreements by the sum of agreements plus disagreements, multiplied by 100 (paralleling agreement-per-occurrence; Salvia, Ysseldyke, & Bolt, 2006). Inter-rater agreement for adhering to Gray’s sentence ratio was 100%; the obtained sentence ratio averaged at 3.57.
The readability of the Social Stories was also checked with the participants. Both Social Stories (Appendix B; C) were written at a 4.6 reading grade level (according to Microsoft Word’s Flesh Kincaid Grade Levels). Although this reading level was above the minimum participation criterion of second grade level, it matched the average actual grade level of the participants (Table 3). All six participants were able to read their assigned (directive or contextual) stories fluently at initial reading.

A comprehension check was conducted after the initial reading of the Social Stories and prior to proceeding to skill practice. Three pre-formulated comprehension questions (Appendix B) related to key information presented in the stories and were printed on the inside back cover of the individual story books. The questions were the same for both story versions and were to be read immediately after the Social Story at each session until the participant could answer all questions (100% correct), to demonstrate comprehension of the concepts in his story. In case of apparent difficulties, the given Social Story formulation would be altered (see step #8; Table 2) for clearer understanding, to match the participant’s needs and/or reading level. All six participants successfully answered the comprehension questions after initial reading. Thus, the initially developed Social Stories (Appendix B; C) were used for the intervention with all six participants; and even though individualization would have been possible and even obligatory if needed, for the selected six participants no modifications were shown to be necessary.

**Materials.**

The Social Stories and comprehension questions used in the current study were printed on white paper with a 16-point font, one paragraph per page. The contextual Social Story, containing more (social-contextual) information, was slightly longer than the directive Social Story; yet the difference was accounted for by a minimal, just one additional sheet (two single-paragraph pages) in the story book. The pages were mounted on mixed-color letter size construction paper, the white paper trimmed so that each page was framed by a strip of color showing. The pages were stapled to form a personal story book for each participant. The outside cover page displayed a summative title in a question-format (i.e., How do I set the table for my friends at ‘Agency Program’ at snack time?), to which each story represented an answer. The story books were hole-punched, mounted on a metal ring, and hung up on hooks in a designated area on the Agency Program room’s wall so the participants could access their stories any time.

**Implementation Procedures**

**Reading of Social Stories.**

The Social Stories were read aloud one time at the beginning of each Agency Program session in individual staff-student pairs while they were seated at a table in a small, quiet, non-distractive room of the Agency Program area where routine activities of the Agency Program sessions occurred, and in which the target behaviors would naturally be displayed. Participants were asked to sit with a familiar staff member who then read the participants’ personalized Social Stories with them, with as much active student reading as possible. For example, if a participant struggled with a word or phrase, staff would read aloud those words to them to ensure a fluent and meaningful reading of the stories.

Eventually, a fading schedule (step #10; Table 2) was introduced by gradually shortening each story. In case that the participants read their stories fluently (i.e., staff did not need to help with more than three words), and a change in the performance of the target behavior could be observed during intervention sessions; the intervention would be put on a fading schedule by gradually shortening the text of the stories. Specifically, both versions (directive or contextual) were to be gradually shortened by leaving out one, then two paragraphs from the beginning of the stories, describing the general settings and a larger context; whereas the latter paragraphs focused directly on the performance and explanation of the target behavior (Appendix B; C).

Because all six participants were able to read their stories independently (as defined above) and they successfully answered 100% of comprehension questions, plus a change in the performance of the target behavior could be observed in all cases after as few as two intervention sessions (Figure 1); the intervention was put on a fading schedule beginning at the third reading. The sentence types in the first two paragraphs of the contextual Social Story were varied, so the controlled fading out of these parts of the story has not affected the realization of Gray’s sentence ratio (slight increase from 3.57 to 3.80; acceptable range is 2.00 – 5.00).
Organization of target behavior performance.
At snack times, once at mid-point during each Agency Program session, some students were routinely asked to help set-up for others, while the other students lined up and went to a bathroom to wash hands. For the purposes of this study, a schedule was created to ensure that all six participants were called to be on-duty for table setting sufficient times for baseline data collection, and so that they would be on-duty for table setting in the right order for the matched-pairs multiple baseline design (explained below). Each participant was observed for three baseline and four intervention sessions.

Each of the two participants assigned to be on-duty for table setting in each session, was asked to set a table for four students. The two tables for them to set were positioned at walls facing each other in the dining area, so the participants were working on the table setting task at their own tables facing opposite directions. Such precautions were taken because carry-over effects through the paired participants’ possibly looking at and copying each other’s behaviors could have confounded results (however, no obvious carry-over effects were observed, neither during baseline nor during intervention, for any of the matched pairs and any of the dependent measures (Figures 1; 2). Participants were asked to please set the table for snack time for their friends. Then they were handed four plates, four forks, four knives, four spoons, four cups and four napkins each, handed to them in one pile. At their first intervention session, participants were reminded to remember some instructions for the task they read about earlier that morning, and that their instructions may be different and given personally just for them in their own stories. No further instructions or prompts were given, and any questions raised by the participants were answered with the pre-coded response: Do as you think it would be best.

Data Collection and Analysis
Research design.
A matched-pairs multiple baseline design (Figure 1) was used. Two participants were paired on each of the three tiers of the multiple baseline design; one participant of each matched pair received instruction through a contextual Social Story, the other participant received instruction through a directive Social Story. Participants of the present study were similar in gender, age, literacy and communication skills; so matched participant pairs were created through random assignment.

An adapted (i.e., matched-pairs) multiple baseline design was chosen to counteract multiple-treatment interference or order/sequence effects that may have emerged in multiple or alternating treatment designs (Kazdin, 1982). When more than one treatment is administered to each participant, the possibility exists that the effect of one treatment may be influenced by the effect of another treatment (Campbell & Stanley, 1963). Within the matched-pairs multiple baseline design of the present study, each participant was administered only one treatment (i.e., either the directive or the contextual version of Social Stories). Thus, comparisons of performance for contrasting the two versions of treatment were conducted between, as opposed to within, participants. Comparisons were possible either between those participants making up each matched pair; or comparing the performance of several participants receiving the same version of treatment during the intervention phase, across the three matched pairs.

Scoring and graphing performance.
Baseline and treatment data were collected by recording performance relative to (a) criterion level (percentage of task-analyzed skill steps performed correctly); and (b) the number of trials-to-criterion. Data collected during baseline and treatment observations were graphed (Figure 1) and visually inspected. In addition, (c) response generalization data were collected on the placement of the napkin, along with any questions asked by the participants about napkin placement. Placement codes and questions were charted in a compact visual format for an easy overview and comparison (Figure 2).

For (a) scoring the placement of each utensil, a ‘whole task’ system, similar to whole-interval recording (Cooper et al., 2006), was selected. Specifically, on the finished table setting, all four of the same kind of utensil mentioned in the Social Stories and handed to the participants (i.e., all of four plates, forks, knives, spoons or cups) had to be in the correct position (as in Appendix A; B; C) in order for the response to be counted as ‘correct’ for the corresponding task analysis step. If one or more utensils of the same kind were out-of-place, no score was given for that TA step. This ‘whole-task’ recording system was selected because the target behaviors needed to be increased, and whole-interval / ‘whole-task’ recording tends to underestimate behavior, hence represents a more conservative system when judging increase in behavior (Bailey & Burch, 2002). When assigning a percentage of task-analyzed skill steps performed correctly, each ‘correct’ score was worth 20% (5 TA-steps/utensils X 20% = 100%). This percentage represented the actual criterion level score recorded for data analysis (Figure 1).
For (b) the number of trials-to-criterion, the number of intervention sessions were added up until the first full criterion level score (100%) was achieved. For instance, if a participant scored 60% of criterion in the first intervention session and 100% of criterion in the second intervention session, ‘2’ was recorded for trials-to-criterion score. If no 100% criterion score could be assigned for a given participant at any session, ‘N/A’ (not applicable) was recorded as their trials-to-criterion score (Figure 1).

For (c) the ancillary dependent measure, the placement of the napkin (not mentioned in the Social Stories) was observed as response generalization check. Successful application of the note on predictability of the table setting, to a similar but untrained utensil to be positioned (i.e., the napkin), would result in consistent placement. When recording data, any (consistent) placement of the napkin was acceptable (because no specific position was prescribed in the Social Stories, as opposed to the other utensils). Thus, the idea of consistency in place setting defined a topographically broad response class. The possible spatial positions for the napkin in relation to the other utensils were coded (L=left side of plate; R=right side of plate; U=under utensil[s]; P=on plate; O=over above plate) and recorded for each participant in each session (Figure 2). Combined placement codes were possible to be assigned (e.g., R;U = right side of plate and under utensil[s]; Figure 2).

Treatment Integrity and Reliability of Observations
The principal investigator and the program coordinator of the Agency Program independently monitored the applied components of the Social Stories intervention package. Using the evaluation column of the form presented in Table 2, raters tallied the steps that were appropriately carried out during the process of creating the Social Stories. Inter-rater agreement for the two raters was calculated by dividing the smaller number of tallied steps by the larger number of tallied steps, multiplied by 100 (Salvia et al., 2006). Total inter-rater agreement for following procedures for constructing Social Stories was 100%; with all applicable steps eventually tallied (i.e., rated as carried-out).

The principal investigator served as the primary observer for data collection during target skill performance (i.e., table setting). The program coordinator of the Agency served as co-observer for reliability checks of the observations. Near 20% (recommended by Kazdin, 1982) of all sessions (8 of 42) were co-observed. Retraining would occur if observers did not attain a minimum of 90% agreement on observations conducted intermittently throughout the study.

Reliability of observations on the primary dependent measures were calculated as a percentage, based on individual scores for (a) percentage of criterion (based on pre-defined task analysis steps) attained, and (b) number of necessary trials to criterion; using the formula: lower score divided by higher score multiplied by 100 (Kazdin, 1982; Salvia et al., 2006). Inter-rater agreement for (c) placement of the napkin (ancillary response generalization component) was calculated by dividing the number of agreements by the sum of agreements plus disagreements, multiplied by 100 (agreement-per-occurrence; Salvia et al., 2006). Overall mean inter-rater agreement for the reliability of observations was 93.2% with a range from 86.58% – 100%.

Results
Dependent Measures
Criterion level.
Figure 1 shows the performance graphs of the participants. Five participants demonstrated improved performance of the target behaviors immediately after the first intervention session and the sixth participant (Jonathan) following the second intervention session. Performance levels consistently remained above corresponding baselines. Five participants reached 100% of criterion. One participant’s (Chris) performance reached a plateau at 80%. Three participants (Jonathan, Grant, Bruce) reached a stable plateau at 100%. Within the matched pairs, participants did not copy each other’s behaviors and their performances remained distinct in both baseline and intervention sessions (Figure 1).

The three participants who read the contextual Social Story (Jonathan, Grant, Bruce), demonstrated more consistent and stable performance levels during intervention sessions than did the readers of the directive Social Stories. Further, the three participants who read the contextual Social Story all reached a plateau at 100%, whereas none of the directive Social Story readers did (Figure 1).
Number of trials-to-criterion.

Figure 1 notes the number of intervention sessions necessary to reach 100% performance level criterion. One contextual Social Story reader (Bruce) needed only one trial to reach criterion, and the remaining two contextual Social Story readers (Jonathan and Grant) reached 100% of criterion after two trials. Two directive Social Story readers (Matthew and Jimmy) reached 100% of criterion after three trials, and the remaining one directive Social Story reader (Chris) did not reach 100% of criterion at all. Once reaching criterion, all three contextual Social Story readers (Jonathan, Grant, Bruce) have maintained their performance at criterion level, whereas the two directive Social Story readers who reached criterion (Matthew and Jimmy) both regressed in their performances and did not maintain a stable plateau throughout the intervention phase (Figure 1).
Grant: Place Setting (Contextual Social Story)

Trials to Criterion = 2 / Plateau

Jimmy: Place Setting (Directive Social Story)

Trials to Criterion = 3

Bruce: Place Setting (Contextual Social Story)

Trials to Criterion = 1 / Plateau

Note. *Plateau is defined here as stable performance maintained over several sessions at a given level and not changing any more over the course of intervention for a given participant.

Figure 1. Performance Graphs of Social Story Interventions

Generalization data.
Response generalization data were collected on the placement of the napkin (not included in the Social Stories but given to participants with the other utensils for setting the table). In addition, questions asked by the participants about napkin placement were noted. Figure 2 presents the placement codes and questions asked by participants. Similarly to the variables charted in Figure 1, performance did not show evidence of participants within the matched pairs copying each others’ behavior, neither in baseline nor in intervention phases.

None of the six participants demonstrated consistent napkin placement during baseline. During intervention, all three directive Social Story readers (Matthew, Chris, Jimmy) had variability in the napkin placement. All three contextual Social Story readers (Jonathan, Grant, Bruce) showed stable and consistent patterns of napkin placement during all intervention sessions. Bruce (a contextual Social Story
reader), the only one participant having done so, adapted a napkin placement in the treatment sessions that he had not at all used during baseline; and Jimmy, his matched pair, has not used/copied that position either (Figure 2). All three contextual Social Story readers (Matthew, Chris, Jimmy) asked a question about the napkin’s placement (Grant and Bruce in the first, Jonathan in the second intervention session). None of the directive Social Story readers (Matthew, Chris, Jimmy) asked questions (Figure 2).

**Table 4**

<table>
<thead>
<tr>
<th>Sessions</th>
<th>#1</th>
<th>#2</th>
<th>#3</th>
<th>#4</th>
<th>#5</th>
<th>#6</th>
<th>#7</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Starter (Story Type)</strong></td>
<td><strong>Napkin Setting</strong>&lt;sup&gt;b&lt;/sup&gt; (without Directions) and Questions Asked:</td>
<td><strong>Baseline</strong></td>
<td><strong>Treatment</strong></td>
<td><strong>Baseline</strong></td>
<td><strong>Treatment</strong></td>
<td><strong>Baseline</strong></td>
<td><strong>Treatment</strong></td>
</tr>
<tr>
<td>Matthew (Directive Social Story)</td>
<td>P</td>
<td>O</td>
<td>P</td>
<td>P</td>
<td>O</td>
<td>O</td>
<td>P</td>
</tr>
<tr>
<td>Jonathan (Contextual Social Story)</td>
<td>O</td>
<td>P</td>
<td>P</td>
<td>P</td>
<td>P / “Where do these [i.e., napkins] go?”</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chris (Directive Social Story)</td>
<td>P</td>
<td>R</td>
<td>P</td>
<td>P</td>
<td>L; U / right</td>
<td>L; U</td>
<td>L; U</td>
</tr>
<tr>
<td>Grant (Contextual Social Story)</td>
<td>P</td>
<td>L; U</td>
<td>P</td>
<td>L; U</td>
<td>“Great, I knew this was gonna come ‘cause I read about it this morning”; during task: “Shall I put the napkins under the fork?”</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Jimmy (Directive Social Story)</td>
<td>P</td>
<td>P</td>
<td>O</td>
<td>P</td>
<td>O</td>
<td>O</td>
<td>P</td>
</tr>
<tr>
<td>Bruce (Contextual Social Story)</td>
<td>P</td>
<td>O</td>
<td>P</td>
<td>P</td>
<td>L; U / “Where do napkins go, that was not in the story.”</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note. *The placement of the napkin – even though not included in the Social Stories – was recorded for exploring generalization of the message of the contextual Social Story about predictability of the place setting: “Is there a reason why this place setting came to be a tradition? If people do things, like setting the table, in a similar way all the time, everybody will learn how this is done. People would find the same set-up when they go to a restaurant or to a friend’s house. This way, people will not be surprised, and they will easily find everything they need at the table, right where they learned it should be”. Questions raised about the placement of the napkin would be answered with the pre-coded formula: “Do as you think it would be best”. L=left side of plate; R=right side of plate; U=under utensil(s); P=on plate; O=over above plate.

**Figure 2. Placement of Napkin and Questions Asked About its Positioning (Not Included in Social Stories)**

**Social Validity**

The target behavior of table setting was preliminarily judged by Agency staff as age appropriate and socially valid for this group of 9-13 years of age to perform. Later during the intervention, five staff members were asked to give formal ratings on the acceptability of the goals using a 1-5 Likert-type scale. Table 4 lists the questions used to rate the social acceptability (based on quotes from the Social Story books), the rating code (i.e., verbalized evaluation assigned to the numbers 1-5), and the obtained social validity ratings per question and staff member, plus total average ratings per question. Total average inter-rater score for acceptability of goals was 4.40 with an individual range from 3 – 5, on the 1-5 Likert-type scale.

Five staff members (present with the group of children during the study) were asked to give social validity ratings on the unobtrusiveness / ease of implementation of the intervention (i.e., reading Social Story with student, once at the beginning of each Agency Program session). Table 4 shows the actual questions to rate (based on quotes from the Social Story books), the rating code using a 1-5 Likert-type scale, and the obtained social validity ratings per question and staff member, plus total average ratings per question. Total average inter-rater score for the unobtrusiveness and ease of implementation was 4.40 with an individual range from 4 – 5, on the 1-5 Likert-type scale.
Discussion
This study sought to establish the relative importance of applying Gray’s sentence ratio as a component in a Social Stories intervention package teaching table setting skills to students with ASD. Results suggested that when leaving other intervention components constant in a 10-step approach to constructing and implementing Social Stories (Tarnai et al., 2009), a contextual Social Story (adhering to Gray’s sentence ratio) yielded fewer trials to criterion and maintained stable performance at criterion when compared to a directive Social Story (omitting Gray’s sentence ratio). In addition, a contextual Social Story promoted response generalization. These findings suggest that the social-contextual component of Gray’s Social Story composition guidelines (instrumented through her sentence ratio) is a necessary part of the intervention.

Table 4. Social Validity Rating of Social Story Implementations by the Human Service Agency Program Staff

<table>
<thead>
<tr>
<th>Target Behavior</th>
<th>Expected Outcome</th>
<th>Rater</th>
<th>Is Goal Achieved</th>
<th>Is Intervention Unobtrusive and Easy to Implement</th>
</tr>
</thead>
<tbody>
<tr>
<td>“Later today I will do the job of setting the table at snack time. I will set the table...” (quotation from Story Body)</td>
<td>“Selling the table properly is a skill I can use in many places when I help setting my friends or family at a meal we are having together. People will notice that I can help in a grown-up way, and they will be proud of me.” (quotation from Story Body)</td>
<td>Staff #1</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Staff #2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Staff #3</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Staff #4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Staff #5</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>TOTAL AVERAGE</td>
<td></td>
<td></td>
<td>4.40</td>
<td>4.40</td>
</tr>
</tbody>
</table>

Note. *Average values for goal/obtrusiveness calculated with ratings obtained from five Agency Program staff members. 1-5 scale: 1=strongly disagree; 2=disagree somewhat; 3=indifferent; 4=agree somewhat; 5=strongly agree. *Implementation: reading Social Story with student, with as much active student participation as possible, once at the beginning of each Agency Program session.

The Text of a Social Story – Social Elaboration through Gray’s Sentence Ratio
Extending the research base.
Gray’s (1995, 2003) intuitive recommendations for a social-contextual framework to mere task-analytical instruction of a target skill do parallel research findings in the literature. Scott et al. (2000) suggest that social communication training for individuals with autism should involve instruction on ‘who to ask’ and ‘when to ask’ beyond the technique of asking a question, that is, ‘what words to use’ (pp. 257). Myles (2005) theorized that Social Stories may help individuals with ASD map out relevant cues and understand contexts of behavior. Along this line of thought, added social-contextual information may aid instruction for similar reasons to those Bandura (1974; 1977) and colleagues (Bandura & Huston, 1961; Bandura, Adams, & Beyer, 1977) outlined in their social learning theory. According to Bandura (1977), reductions in fear, presented symbolically (situational circumstances in which behavioral attainments occur) improve self-efficacy. Mapping out environmental cues and contexts of target behavior performance through Social Stories may serve as a means of reducing fear of the unknown, and resistance to change of routines; easing a characteristic burden to initiating (social) behaviors by individuals with ASD (APA, 1996).

Khemka (2000) and Khemka et al. (2005) found in empirical studies that a decision-making training approach for students with cognitive disabilities, which addressed both cognitive (i.e., knowledge of facts) and motivational (i.e., personal and community values; goal-awareness and goal-directedness) was superior to a cognitive-only training approach. Their findings parallel Gray’s experience-based, but not evidence-supported, intuitive suggestions (1995; 2003) for adding broader, social-contextual information to a Social Story; which she intended to guarantee through the vehicle of a ratio of specific sentence types in a Social Story (Table 1).
The present study replicates Khemka’s (2000) and Khemka et al.’s (2005) findings in the context of a Social Stories intervention package to teach table setting skills to students with ASD; and the results offer evidence-based support for using Gray’s sentence ratio. These outcomes extend the field’s knowledge base about efficient implementation of Social Stories and reinforce the use of broader, social-contextual information when explicitly teaching a target skill.

Further, highlighting a justification for the performance of the target behavior taught, in addition to merely teaching the technical aspects necessary for successful performance, appears to promote generalization across related behaviors justified by the social-contextual framework. Results on response generalization are preliminary and need to be further explored. The potential of response generalization through contextual Social Stories (i.e., adhering to Gray’s sentence ratio) is promising because individuals with ASD typically have difficulties to generalize the use of skills that were trained explicitly but in isolation (Batshaw, 2002).

The positive outcomes on the generalization measure cannot be considered unexpected because the contextual Social Story version contained explicit information relating to the reasons for, and advantages of, performing the target skill and maintaining a predictability of the place setting. Thus, Gray’s sentence ratio and sentence classification served as an operationalized tool for social elaboration of the context of target skill performance. Gray’s guidelines ensured that direct instruction on social-contextual cues and backgrounds was included in the instruction, as opposed to the purely task-analysis-guided directive Social Story version. It is not impossible that intuitive, non-planned social elaboration would occur when teaching a student perform a skill with a TA, for instance, by answering spontaneous questions or verbally pointing out cues in the environment. However, there would be no direct and explicit safeguard for the inclusion of such information which, based on the results of the present study, appears to be valuable for teaching efficiency. On the other hand, contextual Social Stories (i.e., the version Gray [1995] originally suggested) explicitly include a tool for social-contextual elaboration, for which Gray’s sentence classification and suggested sentence ratio serve as one possible, operational means.

Classifying question sentences.
A novel issue arose when applying Gray’s sentence ratio to an emerging Social Story. When the independent raters checked the adherence to Gray’s ratio, question sentences in the text (Appendix C) presented a dilemma. Gray’s classifications (Table 1) have not specifically addressed the question format. From a practical point of view, for calculating a sentence ratio, it needed to be decided whether to consider a question a type 1 (descriptive, perspective and/or affirmative) or a type 2 (directive and/or control) sentence.

Since directive and control sentences are to describe either a concrete behavioral response or a strategy to be used (Table 1), and given that a question by its nature lacks such pre-set guidance, both raters have independently coded questions as type 1 sentences, without assigning them to a specific class (i.e., descriptive, perspective and/or affirmative; Table 1). However, because of the low quantity (two) of question sentences in the contextual Social Story (Appendix C), Gray’s sentence ratio would remain within the acceptable range even if those two sentences were omitted from the text (ratio would change to 3.29 instead of the currently rated 3.57; acceptable range is between 2.00 – 5.00); thus, the issue did not represent a confounding factor in the present study. Nonetheless, future research should address the matter.

Instrumentation and Implementation of Social Stories
Participants/Settings.
Only male students (no females participated in the Agency Program sessions in the given summer) were selected to participate in the study. All six participants had good literacy skills and were able to read chronologically age-appropriate grade-level material (Table 3). Social Stories are supposed to be flexible in their construction and adaptable to different reading levels, as needed by their users; but the conditions of the present implementation did not allow for testing such flexibility. However, the limited variability of participant characteristics as a potential weakness of the study is counterbalanced by the fact that the intervention was successful within a natural setting and with an intact group, which supports the practical utility of the intervention for practitioners in real-life implementations.
Independent measures – Procedures.

One possible practical advantage of Social Stories in some instructional situations may be that instruction is ‘removed’ from skill practice in the actual settings and from actual expected performance times. Thus, the intervention is relatively unobtrusive and requires low supervision from the instructor at actual performance times. This has proven itself to be true for the present study, as evident from the social validity ratings by staff on the ease of implementation (average score of 4.40 on a 1–5 Likert-type scale; Table 4).

The reading of the stories quickly became a routine and participants were happy to do it again and again, before Agency Program activities would start for the day. Adherence to routines, which typically is strength of students with ASD (Scott et al., 2000) renders Social Stories a well-suited intervention for this population. Another primary strength of individuals with ASD lies in visual processing (Scott et al., 2000). That is, individuals with ASD often learn and interpret information through things that are seen rather than heard (Myles, 2005). Rosenshine (1997) advocated for the use of graphic organizers for improved cognitive processing. Social Stories or scripts take advantage of strength in visual processing by supplying individuals wit ASD with a written (i.e., permanent) text and are recommended for this population for this specific reason (Scott et al., 2000).

Gray first discouraged (1995), then allowed but did not require (2003), the use of graphical visual aids for supporting the text of a Social Story. It could be questioned whether visual aids themselves would be sufficient to teach target skills. The Social Stories developed for the present study did contain, identically in both versions, a picture of the target place setting; yet, as performance data suggest, the visual representation alone did not lead to 100% performance levels and the differences within the story/text structure of the two versions paralleled differences in performance levels (Figure 1; 2).

Implementations of Social Stories interventions are typically relatively short, spanning over 4–19 days of treatment, as reported in the literature review by Tarnai et al. (2009). In the present study, three baseline sessions and four intervention sessions were run with each participant, adding up to seven sessions per participant. This duration is similar to other studies involving Social Stories, and the treatment manifested clear effects within this time period (Figure 1). However, for clinical significance, future replication studies should follow-up longer implementation periods to demonstrate clear practical advantages on teaching efficiency.

Dependent measures.

For the purposes of the present study, a ‘whole task’ system was selected for scoring the placement of each utensil, i.e., all four of the same kind of utensil mentioned in the Social Stories and handed to the participants had to be in the correct position in order for the response to be counted as ‘correct’. If one or more utensils of the same kind were out-of-place, no score was given for that TA step. This ‘whole-task’ recording system represents a more conservative system when judging increase in behavior (Bailey & Burch, 2002). As a disadvantage, the ‘whole task’ system is less sensitive to small changes in behavior and may under-score performance that is partially correct but not perfect. On the other hand, the system is able to clearly differentiate 100% performance from lower-than-criterion level performances of any kind. Because the main goal and criterion was defined for the present study and in the Social Stories adhering to Gray’s sentence ratio as consistency of place settings, it was less important to analyze what types of from lower-than-criterion level performances occurred than to detect criterion level (100%) performances per se. In this case, more sensitive measures would have provided too much insignificant detail whereas the ‘whole-task’ recording system focused more clearly on the primary dependent measure of interest: criterion level (100% of the task-analyzed skill steps performed appropriately) and trials-to-criterion.

Two of the six baselines (Matt and Bruce, Figure 1) show a slight increasing trend which could represent a confounding factor. In comparison with the other four participants, however, the participants with the slightly increasing baselines showed similar performance patterns to others. Additionally, Matt and Bruce belonged to different treatment conditions and different matched pairs. Matt read a directive story and showed, similarly to other directive story readers, variable performance during implementation sessions; and Bruce read a contextual story and showed, similarly to other contextual story readers, a plateau at 100% performance level.
Limitations of the Study – Future Research Directions

Social Stories draw on a visual strength that many individuals with ASD typically may have, and offer a structured, tangible organization of social concepts that many individuals with ASD typically may need. The present study initiated a component analysis of a literature-based (Tarnai et al., 2009) model intervention package (Table 2) addressing the practical utility of applying Gray’s sentence ratio. Results support the efficiency of Gray’s sentence ratio within the given framework; yet, some open questions still remain.

The limited variability in participant characteristics did not allow for testing the flexibility of Social Stories’ construction in terms of being adaptable to different student functioning levels as needed. Only male students were selected to participate, and all six participants had good literacy skills and were able to read chronologically age-appropriate grade-level material (Table 3). It would be useful to follow-up on the positive outcomes and explore if the same results would hold for different participants and/or in different settings than the ones tested in this study.

Social Story construction guidelines (specifically, sentence typology) need to be revised in light of the dilemma presented by question sentences. Gray’s classifications (Table 1) have not specifically addressed the question format. From a practical point of view, Gray’s sentence ratio would have remained within the acceptable range for the contextual Social Story used in the present study (Appendix C), even if the two question sentences were omitted. Yet, simply omitting questions from Social Stories does not deliver an empirical answer to issues of sentence typology, sentence ratio calculation, and practical (in)significance of their use in Social Stories. It needs to be examined whether questions could be assigned to an already existing sentence type, or if a new category needs to be created for accurate sentence ratio calculation.

For the purposes of this study, no additional strategies (step #5 of the 10-step approach; Table 2) were used to support learning of the target behavior beyond a basic model intervention package; in order to allow a focus on the component analysis addressing Gray’s sentence ratio. Nevertheless, in situations where clinical utility played more important a role than research rigor, target behaviors might be addressed even more effectively with added strategies / materials known as good instructional practices (and reported as being used jointly with Social Stories in some studies, e.g., Barry & Burlew, 2004; Reynhout & Carter, 2006). Such additional strategies / materials may include contrived reinforcement schedules, functional communication training, additional pictures or graphic organizers (Barry & Burlew, 2004; Reynhout & Carter, 2006; Tarnai & Wolfe, 2008). The present study did not examine such factors’ contribution to treatment efficiency. To support the work of practitioners, prospective research should address the issue.

Conclusions

The application of empirically validated, good instructional practices as components of Social Stories intervention packages (Yarnall, 2000; Elder, 2002; Reynhout & Carter, 2006; Tarnai & Wolfe, 2008), as well as building on visual and routine-adherence strengths (Scott et al., 2000) renders Social Stories a well-suited intervention for individuals with ASD. The present study was able to deliver empirical support for using Gray’s sentence ratio in Social Stories, justifying the effort that the adherence to the ratio requires when constructing a story.

However, Gray’s sentence ratio is certainly not the only effective component in a Social Stories intervention package. Reynhout and Carter (2006) argue that there may be other elements within such intervention packages, for instance reinforcement and explicit teaching that has much effect on students. Other research-based ‘good practices’ of effective instruction should not be neglected when planning Social Stories interventions for individuals with ASD.

The present intervention was successful within a natural setting and with an intact group, which supports its practical utility for implementation. Furthermore, the intervention was non-intrusive as supported by social validity data. Further research is needed to refine Social Story construction for different student populations with varying characteristics, and to elaborate the use of question sentences within Gray’s typology. Then, with some further component variables (supplementary strategies and/or materials) validated empirically, Social Stories, applying Gray’s sentence ratio, have the potential to become a powerful, research-based instructional strategy.
References
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**Appendix A. Task Analysis for Place Setting**

How do I set the table for my friends at Agency Program at snack time?

- Place plate on the table, in front of your Agency Program friend, in the middle.
- Place fork on the left side of the plate.
- Place knife on the right side of the plate.
- Place spoon on the right side of the knife.
- Place cup on the upper left side, beyond the plate, and near the head of the fork.

The order of performing the TA steps does not count in scoring, only the end result (total correct) does (i.e., the correct layout of the dining utensils, in accordance with the graphic).
Appendix B. Place Setting Directive Social Story

How do I set the table for my friends at Agency Program at snack time?

Later today I will do the job of serving my friends at snack time. I will set the table. I will put out a plate for every kid at my table. I will also put out a fork, a knife, and a spoon for every kid at my table. I will put out a cup for every kid at my table, as well.

There is a certain way I will put these things on the table. I will set the table like this:
I will place a plate in front of my Agency Program friend, in the middle.
I will place a fork on the left side of the plate.
I will place a knife on the right side of the plate.
I will place a spoon on the right side of the knife.
I will place a cup on the upper left side, near the head of the fork.
This picture shows what the place setting will look like that I will do:

It does not matter in what order I put a plate, a fork, a knife, a spoon, and a cup on the table. I will repeat the same settings for each of my Agency Program friends at my table.

This is how I will practice setting the table for my friends at snack time.

*Comprehension Questions [same for both (directive and contextual) Social Story versions]:

1. What job am I going to do later today at snack time?
2. Does it matter where I will put a fork for my Agency Program friends?
3. Where am I going to put a cup for my Agency Program friends?
   I will put a cup ___________ (say where you are going to put it).
   I can show the cup in the picture, too (point to the cup in the picture, please).
Appendix C. Place Setting Contextual Social Story

How do I set the table for my friends at Agency Program at snack time?

It is fun to be at Agency Program! I can play games or read a book in free time. In circle time, we share interesting things that happened to us in school or at home. We also play group activities. Then I will work on a project together with the other kids.

There is the Agency Program Bank, too. I can earn dollars for a job I do well. I will sign up for a job. Later today I will do the job of serving my friends at snack time. I will set the table.

When a table is set for guests at a restaurant, or in many homes, there is a certain way this is done. This is a custom in our culture and setting a table is done in a very similar way in many homes and restaurants, and in many countries.

When people set the table for guests, they do it like this:
- We place a plate in front of each person, in the middle.
- We place a fork on the left side of the plate.
- We place a knife on the right side of the plate.
- We place a spoon on the right side of the knife.
- We place a cup on the upper left side, near the head of the fork.

This picture shows what a proper place setting looks like. Have you seen this before?

Is there a reason why this place setting came to be a tradition? If people do things, like setting the table, in a similar way all the time, everybody will learn how this is done. People would find the same set-up when they go to a restaurant or to a friend’s house. This way, people will not be surprised, and they will easily find everything they need at the table, right where they learned it should be. We don’t have to look and search a long time to find where a spoon is. We would know exactly where to find it, on the right side of the plate, even if somebody would prefer to use their left hand to actually hold the spoon to eat with.

I think I am old enough to learn how to properly set the table when I do the job of serving my friends at snack time, here at Agency Program. I will put out a plate, a fork, a knife, a spoon, and a cup for every kid at my table. It does not matter in what order I put these on the table, but I will make sure I put them in the right place, just like in the picture. I will repeat the same setting for each of my Agency Program friends at my table.

Setting the table properly is a skill I can use in many places when I help serving my friends or family at a meal we are having together. People will notice that I can help in a grown-up way, and they will be proud of me!
EXPLORATION OF READING INTEREST AND EMERGENT LITERACY SKILLS OF CHILDREN WITH DOWN SYNDROME

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California State University, Los Angeles

This study examined the reading interest and emergent literacy skills of 31 children with Down syndrome (DS) ages 7 to 13. Parents completed questionnaires on their children’s interest in reading, home literacy environments, and parental beliefs about reading. Children were then assessed on their cognitive and emergent literacy skills. Correlational analyses revealed that parental beliefs related to children’s receptive vocabulary and comprehension, especially when parents reported asking questions during book reading, encouraging children to ask questions and help tell the story, and guiding them to learn lessons and life skills from books. Home literacy environments predicted children’s interest in reading, and children’s mental age predicted their emergent literacy skills. A mental age of 3.50 years appears necessary (but not sufficient) for children with DS to achieve beginning literacy skills.

In this age of emphasis on reading as a key to academic and life success, growing evidence shows that home literacy environments and parental beliefs about reading positively influence children’s emergent literacy skills. Parents of children with Down syndrome (DS), in particular, increasingly advocate for language and reading interventions for this population as well (Fidler, Lawson, & Hodapp, 2003). Indeed, research suggests that such efforts are worthwhile, with some individuals with DS eventually attaining functional levels of literacy and achieving better than expected performance in reading (Byrne, Buckley, MacDonald, & Bird, 1995; Byrne, MacDonald, & Buckley, 2002; Laws, Buckley, Bird, MacDonald, & Broadley, 1995). However, we still cannot tell exactly how and why some children with DS – but not all – become readers. Relatively little is known about these children’s home literacy environments and their parents’ beliefs about literacy. The present study then provides insight into how parents can facilitate the development of emergent literacy skills and interest in reading in their children with DS.

Beginning early in a child’s life and prior to formal schooling, emergent literacy encompasses learning about reading, writing, and print – skills that eventually develop into conventional literacy (Gunn, Simmons, & Kaneenuei, 1998; Lonigan, Burgess, & Anthony, 2000; Sulzby & Teale, 1991). Emergent literacy consists of several components: receptive vocabulary, awareness of print conventions, knowledge of letters and sounds, phonological awareness, and emergent reading (van Kleeck, 1990; Whitehurst & Lonigan, 1998). Receptive vocabulary is critical in the earliest stages of literacy acquisition. Since the act of reading involves mapping visual forms (e.g. words) onto meaningful language, children can benefit from having a semantic representation of a word before they read it. Second, awareness of print refers to knowledge of the purpose, uses, and conventions of print (Clay, 1985). For example, children who demonstrate awareness of print understand that the printed words on a page rather than the pictures convey meaning that text begins from left to right starting at the top of a page and that periods mark the end of sentences (Whitehurst & Lonigan, 1998).

Yet another aspect of emergent literacy, knowledge of letters and sounds involves naming letters of the alphabet and recognizing their related sounds. In alphabetically based writing systems such as English, reading involves translating the units of print (i.e. letters of the alphabet) into units of sound, thus making letter knowledge a strong predictor of later success in reading (Ehri & Sweet, 1991; Johnston, Anderson, & Holligan, 1996). Similarly, phonological awareness involves the ability to detect and manipulate the sound units, or phonemes, of words – a skill that is also critical to reading in an alphabetic system (Gunn...
et al., 1998; Mason & Allen, 1986; Treiman, 2000). Without adequate phonological awareness, children often have difficulty in decoding unfamiliar words (Yopp, 1985). Yet another component, emergent reading is the ability to read words by sight and derive meaning from print. Emergent reading involves the act of deriving meaning from print within its context, such as reading labels, signs, or logos (Whitehurst & Lonigan, 1998).

The home literacy environment has been shown to facilitate the development of these emergent literacy skills in typically developing children (Baker & Scher, 2002; Bus, van IJzendoorn, & Pellegrini, 1995; DeTemple, 2001; Senechal & LeFevre, 2002; Storch & Whitehurst, 2001). The home literacy environment is typically defined as the frequency and nature of literacy-related activities in the home, most notably shared parent-child book reading. In addition, the age of onset of parent-child book reading, the number of books in the home, the frequency of trips to the library, and the frequency and enjoyment of reading by the primary caregiver are also considered aspects of the home literacy environment (Payne, Whitehurst, & Angell, 1994).

Children’s knowledge about print, strategies for reading, and interest in reading are affected by these early home experiences with print (Baker & Scher, 2002; DeTemple, 2001; Gunn et al., 1998; Payne et al., 1994; Senechal & LeFevre, 2002). In their meta-analysis examining the influence of joint reading on children’s literacy skills, Bus and colleagues (1995) found that parent-child storybook reading accounts for up to 8% of the variance in the language growth, emergent literacy, and reading achievement of typical children. In another study, the home literacy environment accounted for approximately 40% of the variance in preschool children’s vocabulary and conceptual/story knowledge, which in turn exerted a strong influence (41% of the variance) on children’s phonological awareness and letter knowledge (Storch & Whitehurst, 2001). In particular, a teaching focus in the home – as defined by the frequency of teaching children to read and print words – is related to acquisition of phonemic awareness, letter knowledge, and vocabulary (Foy & Mann, 2003). Furthermore, family context variables – such as parental attitude toward education, parental aspirations for the child, and conversations in the home – seem to influence the development of emergent literacy skills in typically developing children (van Kleeck, 1990).

To date, only a few studies have explored the home literacy environments of children with DS. In one study, the homes of three preschoolers with DS were found to be print rich (Fitzgerald, Roberts, Pierce, & Schuele, 1995). However, there was little variety in the type of literacy activities, with almost all of the literacy time spent in reading storybooks. In another study – a web-based survey of 107 parents of children with DS – more than 70% of respondents reported having 50 or more children’s books as well as other literacy materials in their homes (Al Otaiba, Lewis, & Whalon, 2009). Most parents in the study reported reading to their children and using literacy materials for 10 to 30 minutes per day. However, Trenholm and Mirenda (2006) found that relatively few of their 224 Canadian respondents who read storybooks to their children reported asking higher-level questions. Although these studies provide insight into the home literacy experiences of children with DS, they did not directly measure children’s emergent literacy skills.

Children with DS can indeed learn to read. Although there is a range of reading achievement among individuals with DS, as many as half of children and adolescents with DS have been found to read at least 50 words (Buckley, Bird, & Byrne, 1996; Buckley & Sacks, 1987). Given good early reading instruction, some children with DS can attain reading levels above that which is expected for their developmental age. Previous studies have shown that children with DS can read at levels that are not only comparable to the reading abilities of typically developing children, but are also more advanced than their own cognitive abilities (Byrne, Buckley, MacDonald, & Bird, 1995; Byrne, MacDonald, & Buckley, 2002). Comparing 24 children with DS (ages 4 to 12 years) to a group of same-aged typical peers, researchers have found that children with DS had uneven cognitive profiles, with relatively advanced reading skills.

Given that the home literacy environment relates to the emergent literacy skills of typical children and that at least some children with DS can eventually attain functional levels of literacy or higher, it is important to investigate the relationship of the home literacy environment, parental beliefs about reading, and the emergent literacy skills and reading interest among children with DS. The present study explored the correlates of emergent literacy skills and reading interest in children with DS, attempting to explain why some, but not all, children with DS eventually learn to read. Specifically, this study attempted to
answer the following questions: 1) What is the relationship between the home literacy environment and the emergent literacy skills and interest in reading of children with DS?; 2) What is the relationship between parental beliefs about reading and the emergent literacy skills and interest in reading of children with DS?; 3) How does children’s interest in reading relate to their emergent literacy skills?; and 4) Is there a necessary mental age for children with DS to achieve beginning literacy skills?

**Method**

**Participants**

The participants in this study were 31 school-age children with DS (aged 7-13 years) and their parents. All children were diagnosed with trisomy 21. As shown in Table 1, the children’s mean chronological age was 10.48 years, and their mean mental age was 4.22 years, based on median age-equivalent scores on the Stanford-Binet IV Intelligence Test (Thorndike, Hagen, & Sattler, 1986). The group consisted of the roughly the same number of boys and girls. All children spoke English as their primary language. More than half of the children were first-born and of Caucasian background. Of the remaining children, nine were Hispanic and one was Asian. The mothers of these children were mostly married, in their late 30s to mid-40s, and had at least some college education. Most families in this study had household incomes above $50,000.

**Table 1. Characteristics of children with DS (N = 31)**

<table>
<thead>
<tr>
<th>Age (years) (mean±SD)</th>
<th>10.48 (1.62)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender (males:females)</td>
<td>16:15</td>
</tr>
<tr>
<td>Mental Age (SB-IV median AE) (mean±SD)</td>
<td>4.22 (1.06)</td>
</tr>
<tr>
<td>Primary Language (English:Other)</td>
<td>31:0</td>
</tr>
<tr>
<td>Number of siblings (mean±SD)</td>
<td>1.84 (1.27)</td>
</tr>
<tr>
<td>Birth order</td>
<td>1&lt;sup&gt;st&lt;/sup&gt; 17</td>
</tr>
<tr>
<td></td>
<td>2&lt;sup&gt;nd&lt;/sup&gt; 4</td>
</tr>
<tr>
<td></td>
<td>3&lt;sup&gt;rd&lt;/sup&gt; 5</td>
</tr>
<tr>
<td></td>
<td>4&lt;sup&gt;th&lt;/sup&gt; 3</td>
</tr>
<tr>
<td></td>
<td>5&lt;sup&gt;th&lt;/sup&gt; or more 2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Ethnicity</th>
<th>Caucasian 18</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Hispanic 9</td>
</tr>
<tr>
<td></td>
<td>Asian 1</td>
</tr>
<tr>
<td></td>
<td>Mixed 3</td>
</tr>
<tr>
<td>Mother Age (mean±SD)</td>
<td>41.77 (5.23)</td>
</tr>
<tr>
<td>Mother Education (mean±SD)</td>
<td>15.03 (1.97)</td>
</tr>
<tr>
<td>Mother Hrs worked (mean±SD)</td>
<td>17.98 (17.92)</td>
</tr>
<tr>
<td>Income level</td>
<td>&lt; $50k 8</td>
</tr>
<tr>
<td></td>
<td>$50k-$100k 10</td>
</tr>
<tr>
<td></td>
<td>&gt; $100k 13</td>
</tr>
<tr>
<td>Marital Status of parents</td>
<td>Married 27</td>
</tr>
<tr>
<td></td>
<td>Divorced 2</td>
</tr>
<tr>
<td></td>
<td>Stepfather 2</td>
</tr>
</tbody>
</table>

**Procedures**

Approval to conduct research with human subjects was obtained from the Institutional Review Board at the University of California, Los Angeles. The author attended meetings of support groups for parents of children with DS in the greater Los Angeles area, distributing flyers about the study and making announcements requesting the voluntary participation of parents of school-age children with DS. Parents who expressed interest in participating in the study signed consent forms and provided their contact information. Once agreeing to participate in the study, all parents were mailed a packet of questionnaires inquiring about home literacy practices, parental beliefs about reading, children’s interest in reading, and other family characteristics. The parents completed and returned the questionnaires to the author by mail or in person. Parents reported that the questionnaires took approximately 30 to 45 minutes to complete.

In the next phase of this study, parents brought their children to the university for a testing session. At this appointment, the children were asked for their assent to participate in the study in the presence of their parents. Upon obtaining the children’s assent, the author tested the children on their cognitive functioning, receptive vocabulary, phonological awareness, alphabet knowledge, familiarity with print
conventions, and ability to comprehend meaning from written text. The testing session lasted approximately 45 minutes to one hour.

**Measures of home literacy environment and parental beliefs about reading**

**Home Literacy Environment Questionnaire.** This questionnaire contains 18 items measuring children’s exposure to reading, the availability of print materials in the home, children’s exposure to outside, literacy-related activities, as well as other home activities that foster language and literacy development. The items were scored on a 5-point scale (1 = never; 5 = everyday). The scores on the 18 items were then added together to create the total home literacy score, with a higher score indicating a more literacy-rich home environment. Created for the current study, this questionnaire was based on previous studies examining home literacy environments of young typically developing children (DeBaryshe, 1995; DeTemple, 2001; Griffin & Morrison, 1997; Storch & Whitehurst, 2001). For the sample of children with DS in the present study, Cronbach’s alpha for the 18 items of the Home Literacy Environment Questionnaire equaled .72.

Items on the questionnaire included the following: How often do you (or another adult in the home) read books or magazines to your child?; how often does your child read (or pretend to read) books or magazines to you?; how often do you read books with your child that relate to his or her current interests?; how often do you recite rhymes, poems, or sing songs with your child?; how often do you tell stories or jokes to your child?; how often do you take your child to the library or a bookstore?; and how often have you tried to teach your child to read words frequently seen in the environment or in your child’s books?

**Parent reading belief inventory (PRBI).** The Parent Reading Belief Inventory measures parental beliefs and goals about reading with their children (DeBaryshe, 1990). The PRBI has been used in studies of parents of young typically developing children (DeBaryshe, 1995; DeBaryshe & Binder, 1994). This questionnaire consists of 42 items scored along a 4-point Likert scale (1 = strongly disagree, 4 = strongly agree, with some items reverse scored). The items vary in content, but each measure some aspect of parental beliefs about reading. Thus, the questions measure parental efficacy (as a parent, I play an important role in my child’s development); parental affect (reading with my child is a special time we love to share); child participation (I ask my child a lot of questions when we read); child growth (my child is too young to learn about reading-reverse scored); child knowledge (I try to make the story more real to my child by relating the story to his or her life); parental resources (Even if I would like to, I’m just too busy and too tired to read to my child-reverse scored); and environmental stimulation (some children are natural talkers; others are silent. Parents do not have much influence over this-reverse scored). All items on this measure were added together for a total score. A higher total score on this measure reflects beliefs that parents are important teachers; children should be active participants in reading sessions; the goals of reading are enjoyment, knowledge, and oral language; limited time and resources should not prevent parents from reading with their children; and language is influenced by environmental stimulation (DeBaryshe & Binder, 1994). For the sample of children with DS in the present study, Cronbach’s alpha for the 42 items equaled .82.

**Measure of children’s interest in reading**

**Child Interest in Reading Questionnaire.** This questionnaire, measuring children’s enjoyment of reading, was created for the present study and was based on previous studies that have examined children’s interest in reading (DeBaryshe, 1995; Storch & Whitehurst, 2001). The four items were scored along a 5-point Likert scale (1 = never; 5 = everyday). The sum of the four items was used as the indicator of children’s interest in reading, with a higher score representing greater child interest in reading. The questionnaire contains the following items: 1) In a typical week, how often does your child amuse himself/herself with books?; 2) In a typical week, how often does your child ask you to read to him/her?; 3) Typically, how much does your child like reading books with you?; and 4) How many books does your child like to read each time you read with him/her? For the sample of children with DS in the present study, Cronbach’s alpha for the four items of the Child Interest in Reading Questionnaire equaled .62.

**Measures assessing children’s functioning**

**Stanford-Binet Intelligence Scale, Fourth Edition.** The general purpose abbreviated battery of the Stanford-Binet Intelligence Scale IV assesses the four cognitive areas of verbal reasoning, quantitative reasoning, abstract/visual reasoning, and short-term memory (Thorndike et al., 1986). The six subtests of
vocabulary, comprehension, pattern analysis, quantitative, memory for sentences, and bead memory were administered to the children in this study. This battery requires less time than the complete battery, but still provides a reasonably accurate estimate of cognitive level. Normed on more than 5,000 individuals, the Stanford-Binet Intelligence Scale IV has good validity and reliability (with the median reliability for the composite score across all ages equal to .97). The Stanford-Binet Intelligence Scale IV has been used in studies of children with Down syndrome (Miller, 1999).

Measures of children’s emergent literacy skills

Test of Early Reading Ability-3. The Test of Early Reading Ability-3 (TERA-3) was used to measure children’s emergent literacy skills (Reid, Hresko, & Hammill, 2001). The TERA-3 contains three subtests: Alphabet (knowledge of alphabet, sound-letter correspondence, and basic sight words), Conventions (familiarity with print conventions), and Meaning (ability to comprehend the meaning of printed material). The subtests are presented in a spiral booklet to be placed in front of the child, with small item-by-item directions written at the top for the examiner. In the Alphabet subtest, the child identifies letter names, words, and sounds in words by pointing to or naming them, as well as identifying the number of phonemes and syllables in visually presented words. In the Conventions subtest, the child is again presented with visual stimuli (such as a logo, pages of a book, or a paragraph) and identifies through pointing or a verbal response various aspects of print conventions, such as book orientation, letter and word orientation, directionality of text, punctuation, capitalization, and spelling. In the Meaning subtest, the child identifies environmental print such as logos, matches words with pictures, and responds to comprehension questions about words, sentences, and paragraphs. For the purpose of this study, age-equivalent scores on each of the subtests were used as measures of children’s alphabet knowledge, familiarity with conventions of print, and comprehension skills. Normed on more than 1,000 children across the United States, the TERA-3 has good validity and reliability (approaching or exceeding .90 on all but two coefficients). Earlier editions of the TERA have been used with young typically developing children ages 3 to 8, and thus are appropriate for use with the children with DS of similar mental ages in the present study (DeBaryshe, Binder, & Buell, 2000; van Kleeck, 1990).

DIBELS Initial Sounds Fluency Test (ISF)

This brief phonological awareness test assesses a child’s ability to recognize and produce the initial sound in an orally presented word (Kaminski & Good, 1998). The child is presented with four pictures and listens to the examiner name each picture. The child then identifies (by pointing or saying) the picture that begins with the sound produced orally by the examiner. This measure consists of 16 items, which are scored as either 0 or 1. The total time for the child’s responses on the 16 items is recorded in seconds using a stopwatch. The ISF score is then calculated using the total number of correct responses in 60 seconds (60 x number correct/duration of response). The ISF score was used as the measure of subjects’ phonological awareness ability. The Initial Sounds Fluency Test has good reliability and validity (Good et al., 2004). Since this measure is designed for use with preschool and kindergarten-age typical children, it is also appropriate for children with Down syndrome who are of this mental age.

Peabody Picture Vocabulary Test – Third Edition

Age-equivalent scores on the Peabody Picture Vocabulary Test-III (PPVT-III) were used to measure children’s receptive vocabulary skills in this study (Dunn & Dunn, 1997). In this test, child is presented with a set of four pictures while the examiner orally states a stimulus word. The child selects the picture that best represents the meaning of the stimulus word. Normed on more than 2,000 individuals, this test has good validity and reliability (with median reliability coefficients in the .90s). An earlier edition of the PPVT-III has also been used in studies of children and adolescents with Down syndrome (Chapman, 1999; Miller, 1999).

Results

Gender. A series of t-tests was conducted to determine if children’s gender played a significant role in scores on the measures of home literacy environment, parental beliefs about reading, and children’s interest in reading, as well as the children’s scores on the emergent literacy measures of TERA-3, PPVT-III, and DIBELS ISF. There were no significant differences between boys and girls on all variables except the measure on parental beliefs about reading. There was a marginal effect of gender on the PRBI total score (girls > boys). Due to its limited role, however, gender was not considered in further analyses of outcome variables. See Table 2 for means and standard deviations of total scores on the questionnaires used in this study.
Table 2. Means and standard deviations on questionnaires

<table>
<thead>
<tr>
<th>Measure</th>
<th>Mean (Standard deviation)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Home literacy environment</td>
<td>56.97 (8.76)</td>
</tr>
<tr>
<td>Parental beliefs about reading</td>
<td>141.71 (11.59)</td>
</tr>
<tr>
<td>Children’s interest in reading</td>
<td>14.74 (3.19)</td>
</tr>
</tbody>
</table>

Children’s Interest in Reading
As shown in Table 3, correlational analyses indicated that children’s interest in reading was significantly associated with both the home literacy environment and with parental beliefs about reading. However, there were no significant associations between children’s interest in reading and any of the emergent literacy measures of alphabet knowledge, print conventions, comprehension, phonological awareness, or receptive vocabulary. Children’s interest in reading also did not correlate with their chronological or mental ages.

Table 3. Correlates of emergent literacy skills in children with DS

<table>
<thead>
<tr>
<th>Item</th>
<th>PA</th>
<th>Vocab</th>
<th>Meaning</th>
<th>Print</th>
<th>Alphabet</th>
<th>Child interest in reading</th>
<th>Parental beliefs</th>
<th>HLE</th>
<th>CA</th>
</tr>
</thead>
<tbody>
<tr>
<td>MA</td>
<td>.59**</td>
<td>.76**</td>
<td>.61**</td>
<td>.76**</td>
<td>.65**</td>
<td>.10</td>
<td>.30</td>
<td>.33</td>
<td>.48**</td>
</tr>
<tr>
<td>CA</td>
<td>.59**</td>
<td>.39*</td>
<td>.29</td>
<td>.59**</td>
<td>.64**</td>
<td>-.28</td>
<td>-.03</td>
<td>-.17</td>
<td>--</td>
</tr>
<tr>
<td>HLE</td>
<td>.07</td>
<td>.22</td>
<td>.14</td>
<td>.10</td>
<td>.05</td>
<td>.52**</td>
<td>.51**</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Parental Beliefs</td>
<td>.25</td>
<td>.43**</td>
<td>.39*</td>
<td>.23</td>
<td>.13</td>
<td>.42*</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Child reading interest</td>
<td>-.11</td>
<td>-.04</td>
<td>-.21</td>
<td>-.15</td>
<td>-.07</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Alphabet AE</td>
<td>.57**</td>
<td>.67**</td>
<td>.68**</td>
<td>.61**</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Print AE</td>
<td>.61**</td>
<td>.66**</td>
<td>.67**</td>
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<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Meaning AE</td>
<td>.49**</td>
<td>.77**</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Vocab</td>
<td>.68**</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
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</tr>
</tbody>
</table>

* Significant at p < .05, ** Significant at p < .01, *** Significant at p < .001

Given the small sample size of this study, only the four variables of home literacy environment, parental beliefs about reading, children’s chronological age, and children’s mental age were then considered as potential predictors of these children’s interest in reading in subsequent regression analyses. Results revealed that home literacy environments best predict children’s interest in reading, accounting for 27% of the variance ($F = 10.64, p < .01$).

Children’s Emergent Literacy Skills
Correlational analyses showed that children’s mental age was significantly associated with all the children’s emergent literacy skills of alphabet knowledge, knowledge of print conventions, comprehension of meaning, receptive vocabulary, and phonological awareness. Similarly, children’s chronological age was significantly associated with all but one emergent literacy skill: comprehension of meaning.

The home literacy environment did not correlate with any of the children’s emergent literacy skills. However, there was a significant association between parental beliefs about reading and children’s emergent literacy skills of receptive vocabulary and comprehension of meaning. Since the total score of the parental beliefs about reading questionnaire correlated with children’s receptive vocabulary and comprehension, further correlational analyses were conducted to determine which specific parental beliefs might relate to these particular emergent literacy skills.

Eleven items on the Parental Reading Beliefs Inventory were identified as having to do with comprehension and receptive vocabulary (as opposed to those asking about identifying letters and words in books). The following items were then considered Meaning-related parental beliefs (Cronbach’s alpha equaled .85): a) Children learn new words, colors, names, etc. from books; b) reading helps children be better talkers and better listeners; c) my child knows the names of many things he or she has seen in books; d) when we read, I want my child to help me tell the story; e) I ask my child a lot of questions
when we read; f) when we read, I want my child to ask questions about the book; g) when we read, we talk about the pictures as much as we read the story; h) stories help build my child’s imagination; i) my child learns lessons and morals from the stories we read; j) reading helps children learn about things they never see in real life (like Eskimos); and k) my child learns important life skills from books (like how to follow a cooking recipe).

As shown in Table 4, several of these parental beliefs significantly correlated with children’s receptive vocabulary and comprehension of meaning. Parents who expressed the belief that they ask their children a lot of questions when they read together, the belief that they want their children to help tell the story, the belief that children learn life lessons and morals from books, and the belief that children learn important life skills from books had children with higher receptive vocabulary and comprehension. Also, children had higher receptive vocabulary when their parents devoted time to talking about pictures during story reading.

<table>
<thead>
<tr>
<th>Specific parental beliefs</th>
<th>Comprehension of meaning</th>
<th>Receptive vocabulary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Child learns new words, colors, names from books</td>
<td>.28</td>
<td>.27</td>
</tr>
<tr>
<td>Reading helps child be better talker/listener</td>
<td>.10</td>
<td>.07</td>
</tr>
<tr>
<td>Child knows names of many things in books</td>
<td>.26</td>
<td>.21</td>
</tr>
<tr>
<td>I want my child to help me tell the story</td>
<td>.36 *</td>
<td>.43 *</td>
</tr>
<tr>
<td>I ask my child a lot of questions when we read</td>
<td>.39 *</td>
<td>.40 *</td>
</tr>
<tr>
<td>I want child to ask a lot of questions when we read</td>
<td>.18</td>
<td>.16</td>
</tr>
<tr>
<td>We talk as much about pictures as we read the story</td>
<td>.34</td>
<td>.49 **</td>
</tr>
<tr>
<td>Stories build child’s imagination</td>
<td>.19</td>
<td>.22</td>
</tr>
<tr>
<td>Child learns lessons/morals from books</td>
<td>.44 *</td>
<td>.58 **</td>
</tr>
<tr>
<td>Reading helps child learn about things never see in real life</td>
<td>.13</td>
<td>.27</td>
</tr>
<tr>
<td>Child learns important life skills from books</td>
<td>.42 *</td>
<td>.52 **</td>
</tr>
</tbody>
</table>

* Significant at p < .05, ** Significant at p < .01

Given these significant correlations, regression analyses were then conducted to determine potential predictors of children’s emergent literacy skills. Due to the small sample size of this study, mental age, chronological age, and the Meaning-related items (grouped together as one variable) were entered as predictor variables.

As shown in Table 5, mental age accounted for 42% of the variance in children’s TERA-3 Alphabet scores, 58% of the variance in children’s TERA-3 Print Conventions scores, 37% of the variance in children’s TERA-3 Meaning scores, 57% of the variance in children’s PPVT-III scores, and 34% of the variance in children’s DIBELS ISF scores. In addition, children’s chronological age accounted for 7% of the variance in TERA-3 Print Conventions scores, 12% of the variance in DIBELS ISF scores, and 14% of the variance in TERA-3 Alphabet scores.

As mental age accounted for the highest variance in emergent literacy skills in children with DS, additional analyses were conducted to determine if there is a necessary (yet not sufficient) mental age that enabled the children to attain beginning levels of literacy. As shown in Table 6, most children who had a mental age of 3.50 years or higher were able to attain alphabet knowledge above 6 years. Similarly, most children with a mental age of 3.50 years or higher were able to attain print knowledge above 5 years.
Table 5. Predictors of emergent literacy in children with DS

<table>
<thead>
<tr>
<th>Outcome Variable</th>
<th>Predictor</th>
<th>Multiple R</th>
<th>$X^2$</th>
<th>$R^2$</th>
<th>F</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Alphabet knowledge</strong></td>
<td>1. MA</td>
<td>.65</td>
<td>.42</td>
<td>.75</td>
<td>20.64</td>
<td>.000</td>
</tr>
<tr>
<td></td>
<td>2. CA</td>
<td>.75</td>
<td>.56</td>
<td>.14</td>
<td>8.73</td>
<td>.006</td>
</tr>
<tr>
<td><strong>Print conventions</strong></td>
<td>1. MA</td>
<td>.76</td>
<td>.58</td>
<td>.80</td>
<td>---</td>
<td>.07</td>
</tr>
<tr>
<td></td>
<td>2. CA</td>
<td>.80</td>
<td>.65</td>
<td>.07</td>
<td>40.33</td>
<td>.000</td>
</tr>
<tr>
<td><strong>Comprehension of meaning</strong></td>
<td>1. MA</td>
<td>.61</td>
<td>.37</td>
<td>---</td>
<td>16.90</td>
<td>.000</td>
</tr>
<tr>
<td><strong>Receptive vocabulary</strong></td>
<td>1. MA</td>
<td>.76</td>
<td>.57</td>
<td>---</td>
<td>38.57</td>
<td>.000</td>
</tr>
<tr>
<td><strong>Phonological awareness</strong></td>
<td>1. MA</td>
<td>.59</td>
<td>.34</td>
<td>.68</td>
<td>15.22</td>
<td>.001</td>
</tr>
<tr>
<td></td>
<td>2. CA</td>
<td>.68</td>
<td>.47</td>
<td>.12</td>
<td>6.31</td>
<td>.018</td>
</tr>
</tbody>
</table>

Table 6. Necessary (but not sufficient) MA for Alphabet > 6 years & Print > 5 years

<table>
<thead>
<tr>
<th></th>
<th>MA ≥ 3.50 years</th>
<th>MA ≤ 3.50 years</th>
<th>Fisher’s $p$ &lt;</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Alphabet knowledge</strong></td>
<td>7</td>
<td>7</td>
<td>0.005</td>
</tr>
<tr>
<td>&lt; 6 years</td>
<td>7</td>
<td>7</td>
<td>0.005</td>
</tr>
<tr>
<td>&gt; 6 years</td>
<td>17</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td><strong>Print conventions</strong></td>
<td>10</td>
<td>7</td>
<td>0.01</td>
</tr>
<tr>
<td>&lt; 5 years</td>
<td>10</td>
<td>7</td>
<td>0.01</td>
</tr>
<tr>
<td>&gt; 5 years</td>
<td>14</td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>

Discussion
Home literacy environments and parents’ beliefs about reading have been found to influence interest in reading and emergent literacy skills of typically developing children (Baker & Scher, 2002; Bus et al., 1995; DeTemple, 2001; Gunn et al., 1998; Payne et al., 1994; Senechal & LeFevre, 2002; Storch and Whitehurst, 2001). Although a few studies have demonstrated that the homes of children with DS have modest levels of literacy experiences, with parents reading to their children 10 to 30 minutes a day (Al Otaiba et al., 2009; Fitzgerald et al., 1995; Trenholm & Mirenda, 2006), there still exists limited research on how home literacy practices and parental beliefs might relate to interest in reading and emergent literacy development in this population.

One goal of the present study then was to examine the correlates of interest in reading among children with DS. Within this study, neither mental age nor chronological age related to children’s interest in reading. Instead, the home literacy environment was the best predictor of interest in reading in children with DS, as has been found in previous studies of typical children (Baker & Scher, 2002; DeBaryshe, 1995). For children with DS, their interest in reading also correlated significantly with their parents’ literacy-facilitating beliefs, indicating that what parents believe about literacy does indeed relate to their children’s interest in reading. Thus, the frequency of home literacy activities matters more for fostering children’s interest in reading than chronological or mental age. This finding provides evidence that parents of children with DS can consider enriching their home literacy environments in order to spark children’s interest in reading.

Another goal of the present study was to explore the relationship between the home literacy environment and emergent literacy skills in children with DS. In contrast to research on typical populations, the present study found no significant correlations between the home literacy environment and any emergent literacy outcomes in children with DS. Instead, mental age emerged as the best predictor of alphabet
knowledge, familiarity with print conventions, comprehension of meaning, receptive vocabulary, and phonological awareness in children with DS. Thus, it appears that mental age as opposed to the frequency of home literacy activities matters more for the development of emergent literacy in this population. This finding is consistent with earlier research showing that mental age is the factor most strongly related to the academic achievement of children with DS (Sloper, Cunningham, Turner, & Knussen, 1990).

As mental age was the best predictor of emergent literacy outcomes, the present study also attempted to determine if there is a necessary (but not sufficient) mental age for children with DS to achieve some early literacy skills. Confirming previous studies that showed that children with DS could achieve reading skills that were more advanced than their own cognitive abilities (Byrne et al., 2002; Byrne et al., 1995), this study found that several children with DS who had a mental age of 3.50 years could achieve alphabet and sight word knowledge above years and print knowledge above years. Because a mental age of 3.50 years is relatively young, this study underscores that children with DS should not be limited in their access to literacy.

The present study also found that chronological age was itself an independent predictor (after mental age) that accounted between 7% to 14% of the variance in alphabet and sight word knowledge, familiarity with print conventions, and phonological awareness – a finding that may be explained by long-term and school exposure. Children’s knowledge of print conventions develops slowly in the preschool years but accelerates as a result of instruction when a child enters school. While skills in alphabet, sight word, print conventions, and phonological awareness can be developed through long-term exposure, children’s receptive vocabulary and comprehension of meaning require more complex, cognitively dependent knowledge, thus explaining why chronological age was not a predictor of receptive vocabulary and comprehension in children with DS.

This study also explored the relationship between parental beliefs about reading and the emergent literacy skills of children with DS. Results showed that parents who expressed beliefs about enhancing children’s comprehension did indeed have children who scored higher on measures of receptive vocabulary and comprehension. While there was a significant correlation between parental beliefs about reading and the frequency of home literacy activities they provided ($r = .51$, $p < .01$), it appears that parental beliefs matter more than home literacy environments for promoting emergent literacy in children with DS. Although we are uncertain about the direction of causality, children with DS seem to achieve higher levels of receptive vocabulary and comprehension when their parents ask them a lot of questions during book reading; encourage them to help tell the story; talk as much about the pictures as reading the story; and encourage them to learn morals, lessons, and important life skills from books. Perhaps these beliefs are leading parents to engage in a quality of interaction that increases their children’s receptive vocabulary and comprehension. This is an area worthy of further investigation, especially given that previous studies have found that relatively few parents reported asking higher-level questions of their children with DS during storybook reading (Trenholm & Mirenda, 2006).

**Limitations and implications**

This study has several implications for children with DS and their families. First, this study provides support for increasing literacy activities in the homes of children with DS. Since the home literacy environment is the best predictor of reading interest in these children, parents may benefit from guidance on how to provide more literacy activities in their homes and increase their children’s interest in reading. This study also identifies certain parent beliefs that are related to higher comprehension and receptive vocabulary in children with DS. Furthermore, this study underscores the importance of appropriate literacy interventions for children with DS. Since long-term exposure, here shown by the independent predictor of chronological age, seems important at least for these children’s ability to learn the alphabet and sight words as well as the conventions of print, perhaps they could demonstrate even further literacy gains given exposure to literacy at earlier ages.

The limitations of the present study must also be considered. First, this study’s measures of home literacy environment, children’s interest in reading, and parental beliefs about reading were parent-report questionnaires. Although most previous studies of home literacy environments have also been based on questionnaires, observing parents and children in their literacy interactions within the home may provide a more detailed analysis of home literacy environments. Perhaps the quality rather than the quantity of home literacy activities influences the development of emergent literacy skills in these children. The
present study also did not measure children’s school instruction or formal home-based interventions. Earlier studies have shown that the type of school placement (i.e. mainstream versus segregated) has an effect – over and above that of mental age – on the academic attainment of children with DS (Sloper et al., 1990). Finally, this study has a small sample of participants, limiting its generalizability regarding predictors of reading interest and emergent literacy skills in children with DS.

Despite these limitations, however, the present study begins to tell us more about home literacy environments, parents’ beliefs about reading, children’s interest in reading, and the development of emergent literacy skills in this population. While mental age appears to be the best predictor of emergent literacy skills in children with DS, this study provides evidence that exposure over time can improve these children’s alphabet, sight word, and print knowledge beyond what is expected for their mental age. Furthermore, specific parental beliefs may influence receptive vocabulary and comprehension in children with DS, and it appears that the home literacy environment can play a key role in increasing these children’s interest in reading. This study is a step toward helping parents further promotes the literacy skills of their children with DS.

References


IF ONLY I HAD KNOWN...: YOUNG PEOPLES’ PARTICIPATION IN THE CONSTRUCTION OF THEIR LEARNING DISABILITY LABELS

Elizabeth Savaria
Kathryn Underwood
Delia Sinclair
Ryerson University

This study explores how young people participate in the construction of their learning disabilities and how the experience impacts their self-concept. None of the interviewees in the study participated in the Identification Placement and Review Committee (IPRC) meetings conducted in Ontario. The interviewees did participate in a variety of other forums such as psychological testing, university development centers, and conversations with family members, and teachers. Thematic analysis identified two key concepts that emerge from experiences of disablement in school systems: the importance of knowledge and the construction of identity through experiences in educational settings. A children’s rights framework and the new sociology of childhood are used to explore the construction of self-concept for children and young people with disabilities. Further, the nature and timing of children’s participation in matters regarding them and their label of exceptionality in the Ontario education system are explored.

Within the scholarly literature there is a recent emphasis on the importance of participation of individuals with disabilities in the educational processes that affect them (McDonald, 2009; Prowse, 2009). This study aims to understand the relationship between the self-concept of an individual with disability and their level of participation in the processes surrounding the construction of their label of disability. In the province of Ontario, where this study was conducted, students are formally identified as exceptional under Ontario Regulation 181/98. The regulation governs a process called the Individual Education Placement and Review Committee (IPRC), and is used if students are deemed to be a pupil whose behavioural, communicational, intellectual, physical or multiple exceptionalities are such that he or she is considered to need placement in a special education program... (O. reg. 181/98, s. 11(1)). This study examines the effects of the identification process on identity formation for exceptional students. The aim of the study was to explore whether young people participate in the label construction of their learning disability, and how these experiences impact on young people’s self-concept.

Researcher Perspective
The lead author of this article was identified with a learning disability at age eight. She had little participation in the identification process and construction of her disability in childhood and adolescence. The experience of being identified with a learning disability has strongly shaped how she sees the world and her perception of equity and inclusion. At times during her academic career she experienced segregation and had little participation or involvement in issues regarding her learning disability and label formation. This study is shaped by the lead author’s experience and is contextualized within a children’s rights framework, and the belief that children and young people should be participants in society.

The personal perspectives of the authors are informed by international standards for children’s rights. The United Nations Convention on the Rights of the Child (UNCRC) outlines the child’s right to participate, as is reasonable with age and maturity of the child (1989, Article 12). Article 23 highlights that children with a disability have the right to enjoy a full and decent life, with conditions that ensure dignity, promote self-reliance and facilitate the child’s active participation in the community. Further
Article 12 states the child who is capable of forming his or her own views [has] the right to express those views freely in all matters affecting the child and that the child shall in particular be provided the opportunity to be heard in any judicial and administrative proceedings affecting the child, either directly, or through a representative (UNCRC 1989, Article 12)

Social Construction of Disability
Socially constructed categories of labels serve many purposes in society. The social model of disability emphasizes the responses that occur in a social context to an individual who is perceived as being disabled (Oliver, 1990). The social model emphasizes the social experience over the pathology of the individual. In this study, we focus on the construction of the disability label, which is the point at which there is a formal construction of the category of disablement. Foucault (1975) explains construction of identities and how knowledge and power are used to create categories of identities, some of which hold more power than others. Labeling is one way in which these power structures are maintained and reproduced because certain labels are viewed negatively while others are viewed positively. The literature identifies long-term implications of disability labeling and the individuals’ lack of understanding and self identification with their label. Higgins, Rashkind, Goldberg, and Herman, (2002) conducted a mixed methods longitudinal study exploring the process by which participants are ‘coming to terms with their learning disability’ and the social and emotional impact of being labelled as learning disabled. Higgins et al. (2002) determined levels of success by operationalizing them as IQ scores, average income, and number of job changes. The ten-year follow-up study used mostly quantitative measures to determine that half of the individuals were ‘successful’. In the 20-year follow-up study, extensive qualitative interviews were conducted in addition to continuing the quantitative measurements. The tests and interviews were organized into themes that explored the awareness of difference individuals felt throughout their lives, particularly their academic related differences, non-academic differences, normative and adaptive value judgments, the labeling event, understanding and negotiating their differences, and not by the participants themselves.

Higgins et al. (2002) found that labeling is detrimental to children. Participants described a process of becoming aware of their differences, understanding and negotiating their differences, the compartmentalization of their learning disability, and finally, the transformation of their learning disability into something positive in their lives. Higgins et al (2002) determined that individuals who were typically successful also had higher correlations of acceptance of their disability. However, relatively few individuals had reached the level of transformation where the label was seen as a positive influence in their lives. The study indicates there are long-term negative effects of labeling which span from childhood to adulthood.

The findings of Higgins et al (2002) directly support the view that young people could benefit from being included in the construction of their disability as the majority of individuals after a 20-year study had yet to reach the transformative stage. The findings suggest that in order to reach the transformative stage, the disability needs to not only be accepted but viewed as a positive attribute in one’s self-concept. This shift in perception may change the way society understands and relates to disability, and how the individual constructs their self-concept.

Similarly, Ingesson (2007) documents how young people with dyslexia reported lower levels of self esteem than their peers and how they were more likely to choose career and education routes that were vocational rather than university-based. Ingesson (2007) conducted semi-structured interviews with 75 teenagers and young adults. They were asked retrospective questions about their experiences growing up with dyslexia. The study found that the first six years after diagnosis were the lowest period of self esteem and that self esteem steadily increased with age throughout school to post secondary education or into the workforce. Of the 75 participants, 40% felt that dyslexia had negatively influenced their self esteem, while 80% felt that dyslexia negatively impacted school and school achievements. Ingesson’s (2007) findings demonstrate that retrospectively adults felt that they had little information about their disabilities in the first six years of diagnosis. With time and understanding, some of the negative impacts of their disabilities decreased and participants began to focus on their other strengths. These results clearly support the argument that labeling has a significant impact on an affected person’s life trajectory in the education system.
The literature suggests that young people’s participation in the construction of their disability may have positive ramifications for their self-concept. Additionally, the literature indicates that young people with disabilities should be valued and given voice in the decisions that impact their lives now and in the future.

**New Sociology of Childhood**

The new sociology of childhood is described by Moss and Petrie (2002) as a social construction of children and young people which has emerged from ethical and political choices. They specifically critique the dominant modernistic discourse in British culture of children in a state of becoming adult and not recognized in their current state because they are weak, poor and needy. (p. 55). Moss and Petrie explain that assumptions of young people impact and shape public provisions and children’s services. Drawing on Foucault, Moss and Petrie claim that norms are created and maintained within a society through the use of language and the creation of hierarchies. These Hierarchies ensure that children’s knowledge is seen as less important or useful, which in turn impacts the identities children hold. Moss and Petrie (2002) reconstruct the term active citizen to incorporate a greater population inclusive of young people, and stretches the current narrow definition of an active citizen as an independent wage earner. Everyone, not only young people, is dependent on care and this dependency should not be used to take away rights as citizens. Moss and Petrie (2002) argue that a discourse focusing on children’s rights, instead of one constructing children as having needs, will help adults treat and conceptualize children and young people as citizens, without over emphasizing their developmental needs.

Moss and Petrie (2002) provide a framework that challenges and dismantles modernistic views of children and young people. A shift in discourse from the need to protect, control and oversee children and young people with disabilities to one of full participation in society as a citizen would significantly disrupt the agenda of social institutions. McDonald (2009) explains that social policy that relates to children serves to define childhood and childhood identities. Participation of children and young people would encourage children to be more active about their rights and citizenship. Moving towards an educational model that incorporates the voice of young people may begin to change young people’s roles in society and perceptions of them as passive recipients of knowledge.

**The Right to Participate**

While the right of children to participate in their own lives has been envisioned in law, several concerns are evident in practice. Davis and Watson (2000) critique the UNCRC in terms of their ambiguity towards children’s competencies in representing themselves. Concerns about competency and maturity are significant determinants of whether or not children are ‘invited’ to participate in decisions that involve them (Davis & Watson, 2000). Research by Curtis, Dooley and Philips (2002), using data from the Canadian National Longitudinal Survey of Children and Youth, found variation between responses of parents and children for some outcomes such as the well-being of children with emotional disorders. However, they found a high degree of agreement between parents and children for observable traits, like academic performance. However, there was a significant discrepancy in the answers of children and their parents with regards to the child’s well-being (Curtis, Dooley & Philips, 2002). Curtis et al. (2002) highlight problems with assuming that parents know more about their child than the child themselves. The literature clearly identifies the importance of children’s participation in label construction.

Understanding of the importance of children’s own viewpoints has resulted in recent research that seeks to understand the unique perspectives of students who have disabilities. Shah (2007) studied preferences of students’ with physical impairments for inclusive or specialized school programs. Singh and Ghai (2009) interviewed children about their understanding of the concept of disability and how it affected their social position and relationships to peers and family in India. Similarly, Najarian (2008) examined the self-identity of Deaf women and their educational experiences. She found that a positive identity was constructed through cultural identification with the Deaf community and in programs that supported educational success for the participants. Our study is embedded in this recent tradition of the importance of understanding experiences of disabement from the perspective of children and young people who have been identified as having disabilities.

**Process of Constructing Identity**

Identity is a complex multilayered and fluid construct. Much has been written about minority identities and the importance of building positive self-concept in childhood. In particular, several studies indicate that being identified as having a disability is an important psychological experience (Fewster, 2002;
In a study of identity construction for individuals with autism, Bagatell (2007) found subjective views of identity. General labels about a group of individuals do not reflect individual capabilities and potential life trajectories. In Bagatell’s (2007) study, individuals with autism want to be included in social interactions and in the assessment process. Such inclusion would allow for individual differences to be explored so that specific needs and strengths could be highlighted.

Using auto-ethnography, Fewster (2002) documented his own experiences with and ethical concerns regarding the labeling of children and young people. He argues that the Diagnostic Statistical Manual IV (DSM-IV) has become the controlling system through which services are funded and provided. He questions the categories created to designate people as having a disability and the modernist assumptions on which they are based. He states that labels are constructed by the power elite and are used to maintain the social and moral order. Fewster’s (2002) fundamental concern is the objectification of the affected subjects. He believes that if individuals were treated with love, curiosity, and compassion, there would be far fewer diagnoses and labels confining and separating people from one another in society.

Both Fewster (2002) and Bagatell (2007) point to the importance of understanding local knowledge and understanding the individual instead of the socially constructed label that has been place upon them. These two studies illustrate that labels are generalized, and that to truly understand people, professionals must provide an opportunity for everyone to participate in the construction of disability labels.

The identification process has created a dichotomous discourse of normalcy and disability that may be applied to children from a very early age (Leiter, 2007). Categories of disabilities stress difference and dichotomize individuals rather than viewing everyone holistically. On a micro-individual level, Leiter (2007) found that individual attitudes were reflective of these mutually exclusive categories of normal and disabled and found that parents’ views contribute to children being categorized by their disability. Similarly, Singh and Ghai (2009) found children were influenced by dominant discourses of normality and disability. Clearly there are underlying systematic constructions of disabilities which are central to individual constructions of identity. Categories and labels of disabilities are, therefore, socially created. Thus young people acquiring these labels should have a voice in their construction.

Context
A common discourse of childhood is that parents know what is best for their children. This is evidenced in Ontario Regulation 181/98, s.5 (2), which positions parents to speak in the best interests of their children. This position reflects our cultural perspective regarding the inclusion of young people in the creation of their labels. Ontario Regulation 181/98 entitles parents, as well as pupils 16 years of age or older to attend IPRC meetings. In addition, any pupil who has had an IPRC is required by law to also have an Individual Education Plan (IEP) which is to be updated yearly with parents and professionals (O. Reg. 181/98, s. 6).

The Toronto District School Board (2007) reports that 79 percent of 16 year olds were not invited to participate in their Identification, Placement, and Review Committee (IPRC) meetings. Sixteen is the age at which young people in Ontario are deemed legally entitled to participate in these meetings. Yet a vast majority of students are not being included. Bennett, Dowret and Weber (2008) state that a total of 7.12% of elementary school, and 12.93% of secondary school children in Ontario were labeled with exceptionalities in 2007. Decisions made in the IPRC process result in the creation of disability labels, referred to as exceptionality, that become a significant part of a young person’s identity throughout their academic career. Ontario Regulation 181/98 excludes young people under the age of 16 from their IPRC meetings reinforcing the devaluation of young peoples’ voices in the construction of their disability. The language that is used throughout IPRC policy highlights the dichotomy between typically developing children and those with exceptionalities. Leiter (2007) critiques this type of language which is also present in federal and state legislation in the United States (US). The Ontario Education Act, US legislation and state policies use language that creates mutually exclusive categories between normalcy and disability. While the policy framework described above is not inclusive of young children participating in the process of their own identifying as having a disability, there is an international rights discourse that includes the right of children to participate.
Method
The study provides local knowledge that draws on a small sample of individuals with learning disabilities and their role in the IPRC process. The study involved qualitative, in-depth semi-structured interviews, with four young people age 17 to 24. Each of the participants was attending either secondary or post-secondary educational institutions and continued to receive supports from their educational institutions. This age group was selected because they were considered old enough to articulate the complex experience of disability identity. They also had sufficient experience across multiple education settings to reflect on differences in treatment from different approaches to assessment and identification processes. One of the risks in asking adults to reflect on their childhood experiences is that there will be error in their recollection. While this affects the reliability of the facts in their anecdotes, the study is focused on the overall feeling that resulted from their experiences. The participants, as high school and University level students, are at an age when they are becoming aware of their own identities (which will be fluid over their life-span), and they are able to reflect on how their early experiences, from their own perspectives, have contributed to their self-concept.

The Participants
Participants were recruited by sending out a call for participants by email. The call asked for students from secondary and post-secondary institutions in the Greater Toronto Area who had been identified as having exceptionality in the category of learning disability through the formal IPRC process in public schools in the greater Toronto area. Interviewing young people was consistent with the rational and underlying theoretical frameworks of this study, which is that children should be active participants in the construction of their disability label. A description of each participant is included below based on the description that each participant gave of themselves. We did not review formal assessments of each participant, but asked them to describe their own disability. The fact that each participant had been identified under the same category, as defined by the Ministry of Education, was to control for differences in service delivery that are likely for different pathological characteristics of disability.

Rita is a young woman 22 years of age. She was diagnosed with a learning disability/exceptionality in elementary school. She received speech and language services as well as attending Special Education and Reading Clinic. She received special education until the end of grade 11 at which time she transferred to an alternative school. At 20 years of age, for her own interest, she undertook another formal psychological educational assessment. It outlined her learning disability as being predominantly in the area of working memory, memory processing and motor skills.

Greg is a 24 year old male who was diagnosed with an exceptionality in grade 3, after he was observed having difficulty reading and writing. Initially, he was in a French immersion program but he switched to the English stream of education. He received support from Special Education and Reading Clinic until the end of grade 10 at which time he transferred to a school without special education services. He also accessed educational support services at two different universities after having undertaken another psychological educational assessment in his first year of university.

Erika is a 24 year old female who was identified as having an exceptionality in elementary school. She moved to Israel during grade 4 to grade 8 where she again was identified as having a learning disability. She received educational support services in Canada and Israel. She then came back to Canada in grade 9 and continued to receive support from a special education program. At 18 years of age, she had another psychological educational assessment done and accessed support services for students with disabilities throughout her university education.

Rick is a 17 year old male currently enrolled in the Toronto public school system. He was diagnosed with Attention Deficit Disorder, behavioral problems, and a learning disability at a young age, and attended a program at a psychiatric facility. He then transferred to a public school where he was segregated in a classroom with individuals with specific needs until the end of grade 5, at which time he attended a special education classroom on a part-time basis.

Interviews
The interviews employed the natural flow of conversation with sharing from both interviewer and participant (Neuman, 2006). This method allowed the flow of the interview to be guided by the participant, with the interviewer inviting each participant to share information at their discretion. Flexible interview questions guided the interviewer to support the general direction of the discussion. The lead
author was the interviewer, and she shared personal experiences and answered specific questions from participants about the nature of her own disability to maintain a relatively neutral power dynamic between participant and researcher (Neuman, 2006).

The interview schedule is as follows:
1. Tell me about the first time you were identified with a disability?
2. Who was involved in explaining it to you?
3. Did you understand the information that was given to you?
4. Do you remember being a part of the IPRC meeting or any other meeting about your identification?
5. How did you understand this information at the time?
6. How has it impacted your life since?
7. Do you think your construction of your identity would have been different if you had been actively involved in the meetings about your disability?

Thematic analysis was used to analyze data through coding methods as outlined in Newman (2006). This consisted of three stages: open coding; axial coding; and selective coding. All interviews were transcribed and uploaded into a spreadsheet file. Each statement from the interviews was inserted into a separate row, allocated a reference number and labeled by participant. The resulting database was then subject to review and analysis. Each statement was read in isolation a number of times and assigned a thematic code. In an iterative process each new statement read was assigned either a previously identified code or a new code. In this way, all statements were coded and the final list of codes was developed. The justification for each theme was documented on the same row of the text being analyzed in the spreadsheet file in order to rationalize the construct validity of each code. Consistency of the application of each theme and subtheme to the data was ensured by reviewing the documented rational for each part of the transcripts and comparing the rational to the definition of each theme and subtheme. As new themes emerged, the entire database of text from the transcripts was revisited to ensure completeness and consistency.

Once all of the codes had been identified, they were organized into a structure that included primary, secondary and tertiary themes. This structured coding method allowed identification of sub-themes that were internally consistent with the overall primary themes. Frequency of the themes and subthemes by participant were calculated from the spreadsheet (see Appendix 2). The frequency data provided information about which themes were most predominantly discussed across the interviews and therefore may have been most important to the participants. However, all of the codes identify important concepts related to participation in the identification process.

Findings
The findings in this study emanate from the overarching themes which arose from a detailed review of the transcripts of the qualitative interviews. These overarching themes were divided into primary, secondary and tertiary themes. After the initial readings of the transcripts, working definitions were constructed for each theme in order to provide a basis for identifying all other relevant quotes in the transcripts and ensuring consistency of coding. Consistent with standard coding methods, the findings will focus on the categories that emerged which have sufficient data to establish the parameters of the category [and] to explicate its properties (Charmaz, 2008, p.167). The frequency of coded themes is presented in Table 1. Two major themes emerge as primary themes: construction of identity and the importance of knowledge as central to participation. The primary themes are presented in the findings of the study with secondary and tertiary themes comprising the content of each of the primary themes. Analysis of the secondary and tertiary codes were used in the exploration of the properties of the two major themes.

Participation
Participants were asked to describe experiences they had with participation in the formal identification of their disabilities. Two key themes emerged from participants descriptions of participation in their own identification process and are described here. The first was that knowledge was central to their participation. The second was that the nature of participation was variable amongst the participants.

Participation in the Construction of the Label of Disability
Overall, the study aimed to understand the experience of participation in label construction for children with learning disabilities. The degree of participation in formal meetings such as IPRC, and IEP
meetings, psychological educational assessments, conversations with teachers, professionals and parents varied in each participant’s case. None of the participants participated in their IPRC meetings and there was limited memory as to participating in the development of the Individual Education Plans (IEP) with the Special Education professionals. Three of the four participants described how their parents spoke for them throughout the IPRC process and how their parents asked the participants questions about their experiences and feelings. The fourth, Rita had no recollection of any conversations regarding her learning disability until much later in life, stating They were all talking about me and writing papers and I didn’t know. The fact that there was limited participation is indicative of the current practice in Ontario special education. It is also interesting to note that the participation that did occur generally related to children being given knowledge.

Table 1. Primary and secondary themes

<table>
<thead>
<tr>
<th>Primary</th>
<th>Secondary</th>
<th>Tertiary</th>
<th>Total Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Construction of Identity</td>
<td>Internal Truth of Self Concept About Disability (Internal)</td>
<td>• Awareness of Difference</td>
<td>53</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Effects on Behaviours</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Evolution of Self Concept as an Individual with a Disability</td>
<td></td>
</tr>
<tr>
<td></td>
<td>External Truth of Self-Concept About Disability (External)</td>
<td>• Discourses of Disability</td>
<td>42</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Education system</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Health Care System</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Peers</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Teachers</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Parents</td>
<td></td>
</tr>
<tr>
<td>Knowledge as participation</td>
<td>Knowledge of Disability (Knowledge)</td>
<td>• Lack of Knowledge</td>
<td>37</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Desire for More Knowledge</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Acquired Knowledge</td>
<td></td>
</tr>
<tr>
<td>Participation in the Construction of the Label of Disability (Participation)</td>
<td>• Yes</td>
<td>52</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• No</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• No Memory</td>
<td></td>
</tr>
</tbody>
</table>

Three of the four subjects spoke about participating more in the construction of their disability labels, as they got older. These three participants all had psychological educational assessments after they graduated from high school at which time they were active participants in the process.

Erika felt that the experience of participation was beneficial to her overall self-concept and that her parent’s more direct involvement was very useful when she was younger. However, she had some ideas about how the process of participation could be better.

I would probably do the same approach as my parents, but I would probably advocate for my child to be a part of their diagnosis, and to talk about it. Talk about how they’re feeling and what’s going on in class, and constantly be in touch with the teacher, and be aware that the teacher knows what the disability is and what the teacher’s assumptions and views are on disabilities. Because if the teacher is against children - like I’ve had a bad experience with teachers - so I don’t want my child in that classroom. I don’t want my child to lack confidence like I had, or that shyness and that feeling of guilt that you have something like a disease or something (Erika).

Erika was not involved in the construction of her learning disability until much later in life. Retrospectively, she thinks life would have been different if she had received the information about her learning disability earlier and had participated more actively at an earlier age.
If my parents hadn’t explained to me a little about what a learning disability was or what was going on with me at that time, I probably would have had even more questions and felt even more ashamed about it. So I think that I should have been a part more. Children should be a part of it and if I was told that when I was younger maybe things wouldn’t have happened like this and maybe we would have found other strategies (Erika).

Rita received information about her learning disability after high school but reflected on the utility of children being part of the process at a younger age.

It would have given the child an opportunity to say what they do like and what they don’t like, and how they feel. It’s hard to say to a teacher, you know when you’re a kid, how you feel and you don’t really have a say. It’s hard to remember though. That was a long time ago, so I don’t really know if I could have even gone to these IPRC meetings. Maybe if I had an educational assessment done when I was younger and people told me that it’s not ADD when I was ten instead of when I was 21, it might have been better (Rita).

Rita also spoke directly about children’s right. She said, it’s kind of a right. It is your own mind right.... it was my right to receive. Rita believed it might have been better referring to her self-concept.

While all participants value participation they acknowledge that certain conditions are necessary for participation to be a positive experience. For example Greg said I think it could have been very useful. I don’t know how you can present something that is that boring and jargony (sic) to a child and keep their interest. If you could do that, that would be very useful for kids with learning disabilities. This is an example of some of the limitations of the current IPRC process. The nature of the meetings may have to change in order for young people to really understand the discussion that is occurring. Greg highlights the tension between the right to participate and the necessity for the process to be child friendly.

Knowledge
Knowledge of one’s own disability was the link between self concept and participation. The basic purpose of most meetings and processes was to understand the child’s disability and it was this knowledge of the specific learning disability of each participant that was central to their conceptions of participation. Knowledge was the first step in participation.

Rita said: I can’t tell if it’s a good thing that I know [about my disability], or a bad thing that I know. She often felt like it is hindering in terms of my confidence [...] like the disability had just grown into a confidence issue. That’s like the new disability. Rita described how the construction of disability has become a part of her identity. However, Rita was not given child friendly appropriate information for her reading level and, as a result, she concluded that her brain was underdeveloped compared to her peers. She viewed this experience as a child’s misunderstanding, and felt intensely frustrated about the impact this lack of understanding had on her life.

I just remember reading stories that were meant for people a lot younger than me, and not liking the stories and feeling really bad and them telling me what level reading I was in. So when I was in grade 6, I had a grade 3 reading level. And to think that you had a brain of a grade 3 in grade 6 wasn’t true - it was just the reading level of someone in grade 3 and younger, and that was the difference. I was reading books that were too immature for me, the content was very young (Rita).

Erika also lacked understanding of her learning disability: ...with my disability I don’t find it to be very defined and I myself still don’t understand it. I know that I need certain accommodations that benefit me.

Three of the four participants were re-diagnosed before going to university. Each of them was interested to understand how their disability had changed and evolved.

Yeah, psychological educational assessment, I had one when I was a kid, and that’s when I sort of got into it. And then I had one after I finished high school, just out of sheer curiosity because I was told I had ADD [Attention Deficit Disorder]. And I had been told I had dyslexia. And I have none of that. I have memory problems and organizational problems. (Rita)
Rita obtained the assessment not for school, but for sheer curiosity. Similarly Erika stated that in the future she would like to be diagnosed again, in order to benefit from having a better understanding of her disability and to develop useful coping strategies.

I actually do want to get re-diagnosed, to see if I have improved, to see if things have changed, to see if I am doing the right thing, to re-evaluate where I am. It [My learning disability] will change as in it may lessen or maybe it will shift and I’ll get new strategies. I myself, I think it’s very important to find other skills and new information about yourself (Erika).

There were two different occasions when Greg received information through his participation in a meeting regarding his learning disability. Greg transferred from one university to another after two years. At the first university Greg met with a psychologist who gave him information in a factual manner. Greg felt there was little room for him to discuss his disability, but provided prescriptive information. At the second university he attended, Greg received information via a mandatory class for students with disabilities, which was provided by the university as a credit towards his degree.

At the first university, it wasn’t very good - like it wasn’t done very well. I found, the psychologist sorta... bad. Well, the psychologist took me into his office and was like you have this disability. It’s kind of like ADD [Attention Deficit Disorder]. We think you would benefit from taking some kind of drug, and I was like that’s really not what I want to do. You know, and I got really pissed off at that point and I just stopped listening to anything he was saying. And he was all contradictory, like we should put you on medication, because we think you have ADD [attention Deficit Disorder], but you don’t actually have ADD [Attention Deficit Disorder]. But you should be on medication anyways and I was no, I don’t want to be on medication. That’s not happening.

He broke it down by my IQ, like the different portions of my brain, and it didn’t make any sense. I have a very good, IQ in... I don’t know what, but in something to do with patterns I am way below average and it didn’t mean anything to me at all. I just didn’t really like the way it was presented. It didn’t really work for me, so I just got upset about it. I was just like I don’t care and I didn’t take advantage of many of the services that were available there at all.

The above excerpts illustrate the powerful impact that the delivery of information can have on a person with a learning disability. It also reveals how this impact can result in adversely affecting behaviour and increasing resentment. On the other hand, if the student feels like they are part of the process it can have a positive effect.

When I transferred to a different university, it was so much better. They had a class for people with learning disabilities and they made you go through your assessment step by step and you had to write a report on your assessment.

It was sort of like a class, and in the class we talked about all these different learning disabilities. We had to bring in our assessment and the teachers looked over it. And then they went over it with you, and they broke it down with you. And you had to write something about what your learning disability was, and there were other portions of the course too, but that was the big benefit of it. And it made me a lot more comfortable with the fact that I do have a learning disability and I learn a certain way.

This experience positively impacted Greg’s behaviour and self-concept. Greg went on to say that he accessed more support services as a result of this experience.

Rita and Erika had similar positive experiences. They both received formal educational assessments after high school which greatly benefited them.

The psychologists was such a great guy. He said that disabilities - everybody has disabilities - that if you need glasses you put glasses on. I have poor motor skills he said. I can’t write very fast and I am too visual. So if something doesn’t look nice, then I discard it. And my short term memory is great, so all these complications turn into the fact that I am really bad at taking notes.
and that I think I’ll remember something, and I don’t remember the next day. So he’s like, all you need is a computer, and that’s your glasses.

Erika describes a second psychological assessment done before going to university:

_The information made me aware of what I have. It changed me. I said to myself, I need to deal with this, and I need to find strategies to work with it. I think it’s very important to get lots of information about your disability. I think it did help me. I think anyone who has an assessment should be informed, and informed about what accommodations they can have to make it easier on them._

**Construction of identity**

The most significant effect of the labeling process as described by participants was the effect on their own sense of self. An individual’s perception of self is influenced by both internal and external factors. These factors are interconnected. Internal factors included awareness of difference, changing behaviours because of awareness of difference and an evolving sense of self-concept as an individual with a disability.

**Internal constructions**

The internal truths that constituted a component of identity had the highest frequency of coded statements of all themes.

All four young adult participants described a form of segregation from typical or normal classmates or activities which were seen as deviating from their peers.

_“I remember the teacher used to come in and call for the three people in the class individually and we had to get up and walk out of the class. So - not only did we know we were different, but everybody in the class knew we were different and that’s sort of – that’s when I realized I wasn’t the same as the rest of them” (Rita)._ 

_“I don’t remember exactly how I felt, I remember feeling weird that my friends were progressing differently than me, and I was like behind. I felt like I wasn’t normal. I felt very, different from the other kids and that there was something wrong with me” (Erika)._ 

_“I felt embarrassed about my learning disability when I was in first year, and second year university too. And then I just stopped caring after a while, but I didn’t want people to know I had a learning disability, because it made me feel stupid, and I thought that they would think that I was stupid as well” (Greg)._ 

Rita revealed her confusion about how to integrate her disability into understanding of self.

_Writing essays was always really difficult. And I can’t tell if it’s because I can’t write essays or because I have a disability or because I have no confidence to write an essay, because I was told I have a disability. And I blame it on the disability” (Rita)._ 

Similarly Erika talked about her disabilities affecting her confidence and how this translated into a fear: _I find I still, I am afraid I am not saying something smart enough, or good enough, or my vocabulary isn’t good enough_. Erika also described a fear of the future, a fear of entering the work force and feeling like she would not be suited to certain jobs because of her construction of self. The following showed her reservations about the future:

_One of my big fears is that, how am I going to go about in the work force? What kind of job would suit me right now? Will I be able to get accommodations? Not every job even knows what that is, or does that. It’s a big deal. But I think for myself because I know what is best for me, that I will find my own strategies to find a job and work with that” (Erika)._ 

Participants shared experiences about the evolution of their self-concept as an individual with a disability. Disability as part of their identity was not stable, but instead, shifted and changed over time. There was a tension between internal construction of disability and how the participants viewed their disability as changing and evolving. Rita said, _the fact that I haven’t been in school for a while, changes_
my identity. I feel more confident with how I speak. Many of the difficulties Rita faced when she was younger were no longer as significant because she had learned useful coping strategies. She stated that the disability had become more of a confidence issue because she saw herself as a wounded learner.

Greg’s self-concept evolved towards a negative view as a result of acquiring knowledge at university. Greg was not receiving formal educational support services. In his last years at high school, he worked closely with teachers who understood and accommodated his needs, but did not label or pathologize him. When he went to university Greg received the formal label of learning disability as a requirement for accessing the appropriate support learning services. Greg reacted negatively. He stated: it bothered me a lot and I had a really hard time with it in University. I didn’t like being labeled at all.

Greg was much more comfortable with his disability in high school where he communicated took initiative with teachers without a formal label. His self-concept or internal truth was negatively impacted when he was required to have a formal identification at university. For Greg, acquired information negatively impacted self-concept and his internal truth.

Rick shared the difference between his experience when he was young and the present. Rick said,

When I was really young, I think I was kind of angry, even before I knew I had a learning disability, or whatever. But after that, I think that I always tried to be funny or whatever. And that’s how I coped, I think. I guess it’s about becoming more confident and having hobbies and stuff helps a lot. Like you don’t focus on it. You don’t care, and if you focus on your strengths it’s better.

External influences
In addition to the internal experiences of disability, there are significant influences from external sources on the construction of identity as an individual with a disability. Both systemic constructions of disabilities and outsiders’ construction of disabilities are important in understanding how these young people view their own identities. These external influences include general discourses of disability; their experiences in the education system or in health care, and their interactions with peers, professionals and family.

Rick speaks about his frustrations with the definition and social construction of the term learning disability and special education. He spoke about how these labels create differences that make children feel bad or excluded. In other parts of his interview, he refers to teachers’ perceptions of him, how others treat him, and that he believed without the label he would not be treated as different from his peers.

Erika explained that her disability influenced her sense of self-concept as being different. She said: I had comments throughout my life, like special needs, special ed, sped. People knew you were different. Social constructions of disability are common in society, and how participants viewed themselves was often in relation to how others viewed them, or how society constructed the label of disability.

Social segregation from typically developing peers was a common concern across the interviews. The manner in which the segregation was implemented in the education system was generally viewed as unsupportive of the individuals’ ability to access services. Segregation, often made the participant more aware of being different, and appears to have negatively impacted their sense of self-concept.

Participants were also affected by their peers, teachers and parents’ constructions of them as individuals with a learning disability. For example, Rick said:

A friend used to make fun of me about it. He used to tell me I couldn’t read. He used to say, you can’t read – you go to reading clinic. He was like Can you read thisssss? and I was like yeah. It was pretty painful really.

Peer groups also had the capacity to improve an individual’s self-concept. The following describes a group of students taking ownership of the experience of special education.

I think it was like some cool kids went there. It was like the cool kid hang out. Like I think Lance was in it at one point. Like me and Lance, and he was this big raver at the time and Justin. It was me and a bunch of boys and we used to spit down the stair well. On the way to reading clinic, we used to take a long, long, time and there were these stairs going up. And if you spit at
the top of the stair sometimes you can make it so it doesn’t hit any of the railings from the third floor. We would try for 10 minutes to spit and it always hit the railings. So it was kinda like a cool thing. We were different, but it’s okay as opposed to if someone makes fun of us. We had more camaraderie (Rick).

Teachers’ constructions of disability greatly affected Rita:

*I think that some teachers have this kind of attitude that they talk small to the kids with an LD. And they kind of think that if you’re like this then you’re not going to be able to do the harder stuff. That they think they are just like helpless and stuff, and don’t push them to try as much hard stuff. It’s a really stupid perception and negative. A lot of kids that have learning disabilities are just as intelligent as or even more than other people (Rita).*

Construction of identity is a complex phenomenon that is affected by both internal and external factors, which interact. This understanding of self also affects the manner in which the participants interacted with others. This complex construction of self was deeply embedded in participants’ experiences in the identification process.

**Discussion**

These reflections from young adults about their own participation are consistent with other studies. Ingesson (2007) found that retrospectively adults felt they had little information about their learning disabilities in the first six years of diagnosis. Ingesson (2007) also found that with time and understanding, some of the negative impacts of learning disabilities decrease and focus shifts to other strengths. The participants in this study described the benefits of participation in the construction of their learning disability, but the focus was clearly on accurate and helpful information, delivered with sensitivity in a manner that was understandable to them at their given age. The literature suggests that it is possible for young people – children - to participate in the construction of their learning disability labels (MacArthur, Sharp, Berni & Gaffney, 2007). Davis and Watson’s (2000) study found examples of children with learning disabilities challenging notions of disability and empowering themselves by making decisions and participating in meetings and decisions affecting them. Furthermore the United Nations Convention on the Rights of the Child (1989) supports this study’s finding that children could have participated in the construction of their learning disability labels either directly or through their parents. Rita stated that *It was my right [to receive the assessment information]*.

Increasing children’s and young people’s knowledge of their learning disability and increasing active participation in the construction of their learning disability label has the potential to impact internal truth, self-concept as *individuals with learning disabilities* and active participation. This study indicates that the effects of the identification process are most keenly felt in terms of children’s self-concept. Reciprocal and developmentally appropriate communication were seen as the most effective mechanisms for communication as Greg’s experience at the two universities and Erika’s experience with the second educational assessment illustrated. This study did not include children in its subject group and hence, it cannot be said that this would necessarily be how young children would view participation. However, the change that students experienced through the course of their education was an interesting finding that has been noted in other research (Fitch, 2003).

Gallagher (2008) noted the importance of studying the effects of participating rather than studying intentions. Participants in this study were engaged in construction of their learning disability labels to a greater degree as they aged. The study also showed that self-concept changes and evolves over time, as children acquire knowledge and are subjected to external influences. These findings suggest that it is important to ensure young people feel comfortable to communicate and share their knowledge for the purpose of better understanding the nature of their learning disability. This can result in children being motivated to participate in the management of their own education and the development of coping strategies, which are effective mechanisms for participation.

Higgins, Rashkind, Goldberg and Herman (2002) found that labeling is detrimental to children. Participants described becoming aware of their *differences* and how they felt bad or like a person with a disease (Erika, Rick). Higgins et al (2002) documented the process of understanding and negotiating differences, the compartmentalization of learning disability, and finally, the transformation of learning disability into something positive in people’s lives. This evolution of disability was an important theme.
that emerged from the interviews in this study. The evolution of disabilities was found to be influenced by acquired knowledge, participation and external truths. Higgins et al (2002) found that relatively few individuals had reached the level of transformation where the label was seen as a positive influence in their lives. Similarly, none of the participants in this study spoke about their disabilities reaching the transformative stage. This study found evidence of the ongoing impacts of labeling on the participants’ identity construction, from childhood into young adulthood, and evidence of the long-term negative effects of labeling (Erika, Rita). Higgins et al.’s (2002) study noted that a lack of information was evident at the stage where people were understanding and negotiating the label. This study provides similar evidence. Most participants discussed the lack of information as an issue and in some cases the lack of knowledge still existed in young adulthood. As more knowledge was acquired, the participants’ self-concept seemed to evolve. This research suggests that as more information is given to young people they may then be able to help construct more useful information, and reach the transformative stage that Higgins et al (2002) identified – where children see their learning disability as a positive in their lives and go beyond developing coping strategies to developing thriving strategies.

Conclusion

Interest in understanding the impact of child or young adult participation is growing in Canada and internationally. Examination of the current Ontario education policies and practices of inclusion of young people in the IPRC meetings and process is an area of study which should be explored further. More research is needed to confirm the findings of this small study, which suggest that increased information and participation of young people in the construction of their learning disability label may have a positive impact on identity formation for children with disabilities. These preliminary results also suggest that such knowledge and positive self-concept encourages young people to better assess potential life opportunities.

The study supports the notion of children and young people being active participants in the construction of their internal truth and identity as an individual with a learning disability. It also supports notions of children as competent and interested in matters that affect them. Young adults have a desire for more knowledge and when they acquire more knowledge in an appropriate reciprocal manner their self-concept evolves and transforms in a beneficial way through development of more effective coping strategies. This research supports change for individuals at the local level as well as at a systemic level during the process of identification. It may be that if more information were given to young people in this stage as explored in the current study, through conversations and participation about the implication and uses of the label, perhaps more individuals would be able to actively participate in the planning of their own education, and to embrace their identity as a person with a learning disability.

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IMPROVING EXPOSITORY WRITING SKILLS WITH EXPLICIT AND STRATEGY INSTRUCTIONAL METHODS IN INCLUSIVE MIDDLE SCHOOL CLASSROOMS

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Forty eighth grade students with and without learning disabilities in an inclusive classroom participated in an adapted Step-Up to Writing (Auman, 2002) intervention program. The intervention targeted expository essays and composing topic, detail, transitional, and concluding sentences. A repeated-measures ANOVA indicated that both students with and without disabilities made significant improvements in expository writing skills as measured on the state’s criterion reference test for written expression.

Written expression can be frustrating and difficult for many middle school aged students. Students may experience difficulties describing information, writing sentences, paragraphs, and essays. Compositions maybe inadequately organized and include excessive spelling and grammatical errors. Many researchers and teachers consider writing instruction a means to assist students to express their ideas, as well as unique perspectives and knowledge of social, political, and historical issues (Gerstein & Baker, 2001).

Graham and Harris (1989) suggested three factors that account for problems for students who struggle with written expression. First, text production was especially cumbersome that it hinders the generation of ideas. Second, students lack the knowledge of the writing process. Third, students were unaware of specific cognitive writing strategies to apply and assist with writing expression. Brown and Campione (1990) suggested that students with learning disabilities in written expression have difficulties acquiring a variety of cognitive and metacognitive strategies and writing skills when taught informal and incidental writing methods unless explicit instruction also was provided.

Explicit and strategy instructional methods are two approaches for teaching written expression skills to students with deficits in writing. Explicit instruction assists with student’s cognitive processes. Explicit instruction does not change student ideas rather it serves to assist with the development of ideas. Explicit instruction has the potential to act as a change inducing agent that promotes the development of the cognitive system of writing (Graham, 1990). Explicit instruction was used successful in improving written expression for students with writing deficits (Englert et al., 1991; Graham & Harris, 1993; 1997; Harris & Graham, 1996; 1999; Troia & Graham, 2002; Walker, Shippen, Alberto, Houchins, & Cihak, 2005; Wong, 1994; 1997; Wong, Butler, Ficzere, & Kupersis, 1996; 1997). Best practices in expressive writing instruction included explicit teaching of (a) critical steps in the writing process, (b) conventions of a writing genre, and (c) guided feedback.

The use of strategy instruction is another approach to assist students with the cognitive process of writing. Strategy instruction assists students to internalize, execute, appropriately modify, and to maintain the use of specific learning strategies (Wong, 1998). Common strategies included the use of self-directed cues or prompt cards, think sheets, or mnemonics. Strategy instruction prompts students to self-regulate the writing process. These text structures provided a guide for undertaking the writing task at hand, whether it was a persuasive essay, a personal narrative, or an essay comparing and contrasting two phenomena. Strategies were used successfully to improve written expression skills for students with writing deficits (Graham & Harris, 1996; 2000; Graham, Harris, & Troia, 1998; Graham, Harris, MacArthur, & Schwartz, 1991; Sawyer, Graham, & Harris, 1992). Strategy instructions were often taught to students using explicit instructional procedures. The teacher invariably modeled how to use
these steps by writing several samples. With this in mind, explicit and strategy instructions work in conjunction to improve students’ written expression skills (McCutchen, 1987; Wong).

Due to the federal No Child Left Behind Act (NCLB, 2001) more and more students with disabilities are being included in assessments that are used as a measuring stick for schools and students today. Thus, students with disabilities in the general education classrooms are a primary target of intervention strategies for teachers. Baker, Gerstein, and Graham (2003) noted that future research was needed in effective writing instruction. Specifically, large-scale classroom practice that included both students with disabilities and students without disabilities required investigation.

Step Up to Writing (Auman, 2002) is a commercially produced expository writing program based on the principles of explicit and strategy instructional techniques. The goal of the program is to improve students’ response to a writing intervention. It was designed for middle school aged students to facilitate their abilities to construct expository essays. Using explicit and strategy instructional methods, step-by-step guidelines, modeling, guided practice, extended interactive practice, and frequent feedback, Step Up to Writing (Auman) provided students structured experiences to develop writing skills successfully (Simon, 2003; Sopris West Educational Services, 2003).

The purpose of this study was to examine the effects of an adapted commercially produced writing program for classroom practice. Specifically, how will Step Up to Writing (Auman, 2002) assist written expression skill for students with learning disabilities and students without disabilities in eighth-grade inclusion classrooms?

**Methods**

*Participants and Setting*

Forty-five eighth grade students and one classroom teacher from a rural Southeastern middle school participated in the study. Twenty-one males and 24 females were enrolled in the two Language Arts inclusion classrooms. Forty-two percent (n=19) of the students qualified and received special education services under the specific learning disability category for written expression. One class consisted of 23 students with 10 students with disabilities. The second class consisted of 22 students with nine students with disabilities. All students with disabilities met state and local criteria for special educational services (i.e., 20 point discrepancy between IQ and achievement for written expression). Table 1 lists specific characteristics for students with and without disabilities. Students with disabilities specifically demonstrated difficulties including (a) organizing ideas, (b) creating topic sentences, (c) expressing ideas to the reader (d) using details, and (e) creating conclusion sentences.

*Materials*

The lessons used with this writing intervention were created with adaptations from the Step Up To Writing program (Auman, 2002). The program offered many different ideas to improve student’s skills to organize ideas, create topic sentences, use transitions, develop supporting details, and create a concluding sentence. Specific materials used in this writing intervention included: (a) examples of expository essays, (b) newspaper, (c) color markers to highlight different types of sentences, and (d) paper and pencil.

*Variables and Measure*

The independent variable was five lessons from the Step Up To Writing (Auman, 2002) expository writing intervention. The five lessons targeted specific structural elements of expository writing including topic, detail, conclusion, and transitional sentences. The dependent variable was expository writing skills. Students composed a five paragraph expository composition. A state’s expository writing skills assessment (Tennessee Department of Education, 2005) was used to score all compositions. The expository writing skills assessment is a seven point rubric, which rates students writing skills from zero or inability to score to six or outstanding composition. A score of four or higher was considered a competent composition. Table 2 lists the possible writing scores and corresponding description.
Table 1. Student Characteristics

<table>
<thead>
<tr>
<th>Variables</th>
<th>Students with Disabilities</th>
<th>Students without Disabilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (M / SD)</td>
<td>14.30 .46</td>
<td>14.10 .43</td>
</tr>
<tr>
<td>Gender (n)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Boys</td>
<td>15</td>
<td>6</td>
</tr>
<tr>
<td>Girls</td>
<td>4</td>
<td>20</td>
</tr>
<tr>
<td>Ethnicity (n)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>European American</td>
<td>17</td>
<td>24</td>
</tr>
<tr>
<td>African American</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Hispanic</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Free/reduced price lunch (n)</td>
<td>16</td>
<td>23</td>
</tr>
<tr>
<td>Additional disability (n)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LD Reading</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>LD Math</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>ADHD</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Emotional Disorders</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>IQ* (M / SD)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Verbal scale</td>
<td>101.40</td>
<td>10.17</td>
</tr>
<tr>
<td>Performance scale</td>
<td>105.60</td>
<td>15.60</td>
</tr>
<tr>
<td>Writing composite score*b (M / SD)</td>
<td>76.00</td>
<td>8.12</td>
</tr>
<tr>
<td>Number of years in special education (M / SD)</td>
<td>4.7</td>
<td>.90</td>
</tr>
</tbody>
</table>

Note. LD = learning disability and ADHD = attention deficit/hyperactivity disorder. *IQ tests used were the Wechsler Intelligence Scale for Children-Third Edition (WISC III) and the Stanford-Binet Intelligence Scale-Fourth Edition (SBIS-4). bAchievement test used was the Test of Written Language-Third Edition (TOWL-3).

Table 2. Expository Writing Skills Assessment Scoring Rubric

<table>
<thead>
<tr>
<th>Score</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>A 6 paper is outstanding. It demonstrates a high degree of proficiency in response to the assignment but may have a few minor errors. An essay in this category is well organized and coherently developed, clearly explains or illustrates key ideas, demonstrates syntactic variety, clearly displays facility in the use of language, is generally free from errors in mechanics, usage, and sentence structure</td>
</tr>
<tr>
<td>5</td>
<td>A 5 paper is strong. It demonstrates clear proficiency in response to the assignment and may have minor errors. An essay in this category is generally well organized and coherently developed, explains or illustrates key ideas, demonstrates some syntactic variety, displays facility in the use of language, is generally free from errors in mechanics, usage, and sentence structure</td>
</tr>
<tr>
<td>4</td>
<td>A 4 paper is competent. It demonstrates proficiency in response to the assignment. An essay in this category is adequately organized and developed, explains or illustrates some of the key ideas, demonstrates adequate facility in the use of language, may display some errors in mechanics, usage, or sentence structure</td>
</tr>
<tr>
<td>3</td>
<td>A 3 paper is limited. It demonstrates some degree of proficiency in response to the assignment, but it is clearly flawed. An essay in this category reveals one or more of the following weaknesses including inadequate organization or development, inadequate explanation or illustration of key ideas, limited or inappropriate word choice, a pattern or accumulation of errors in mechanics, usage, or sentence structure</td>
</tr>
</tbody>
</table>
Table 2 Continued. Expository Writing Skills Assessment Scoring Rubric

<table>
<thead>
<tr>
<th>Score</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>A 2 paper is flawed. It demonstrates limited proficiency in response to the assignment. An essay in this category reveals one or more of the following weaknesses including weak organization or very little development little or no relevant detail, serious errors in mechanics, usage, sentence structure, or word choice.</td>
</tr>
<tr>
<td>1</td>
<td>A 1 paper is deficient. It demonstrates fundamental deficiencies in writing skills. An essay in this category contains serious and persistent writing errors or is incoherent or is undeveloped.</td>
</tr>
<tr>
<td>0</td>
<td>A 0 paper is reported because a paper could not be scored for one of the following reasons including blank or refusal, insufficient to score or illegible, off topic, or written predominantly in another language.</td>
</tr>
</tbody>
</table>


Writing Probes
Students individually completed three expository composition writing probes administered at pretest (prior to writing intervention), midtest (after lesson three), and posttest (after the writing intervention). Lined paper and a pencil were provided. At the beginning of each writing probe session, the teacher instructed the students to write a composition for the selected prompt. The writing prompts were: (a) the best day I ever spent with my family, (b) the world would be a better place if, and (c) the best gift I ever received. The writing prompts were counterbalanced across probes to ensure that 15 students, including at least six students with disabilities, addressed each topic during pre-, mid-, and posttests. All students had 35 minutes to respond to the prompt. No feedback was provided about the content or quality of the student’s compositions during probe administration.

Writing Intervention Procedures
Five adapted Step Up to Writing (Auman, 2002) lessons were used to provide explicit instructional methods to improve students writing skills. Lessons were adapted to target the conventions of an expository writing and sentence structure. Each lesson occurred for 90 minutes. The first lesson instructed students in the organization of ideas and how to create an informal and formal outline. The classroom teacher explained explicitly the purpose of an outline and then modeled the use of both outline types. While modeling the outline, the teacher emphasized generating as many ideas as possible while identifying key similarities and differences of specific details pertaining to specific subtopics. Students then were given a practice writing prompt and instructed to either create a formal or informal outline. Feedback was provided to students as a group and individually regarding the quality of the outline.

During the second lesson, students were asked to recall the purpose of organizing ideas using an outline. Then, students were instructed on the use of different types of topic sentences of expository compositions. Similar to lesson one, the teacher explained the purpose of a topic sentence and then modeled writing different types of topic sentences from a section of newspaper. The teacher also emphasized and modeled the use of sentence structure, syntactic variety and language usage. Students then were given a copy of different sections of the newspaper and instructed to write a topic sentence regarding one of the stories. Feedback was provided to students as a group and individually regarding the quality of the topic sentence.

The third lesson combined both sentence transitions and supporting details. The teacher explained the purpose of transitions and then modeled how various transitions were used in expository compositions. Then, students were provided with a worksheet with transitional words listed on the sheet. Students were asked to circle the transitional words. Next, the teacher explained the purpose of supporting detail sentences and modeled how details support a topic sentence using three different writing prompts. The teacher also accentuated and modeled syntactic variety and the writing mechanics of detailed sentences, which supported the central theme. Students were then asked to write five supporting detail sentences for the topic sentence; Instead of attending sixth period on Monday, students were allowed to attend a pep-
rally to celebrate the football championship. Similar to previous lessons, feedback was provided to students as a group and individually regarding the quality of transitions and supporting detail sentences.

During lesson four, the teacher reviewed lessons one through three. The purpose of this lesson was to review expository writing, the role of organization in writing, the different types of topic sentences, transitions, and supporting detail sentences. Students were given a worksheet with topic, transition, and supporting detail sentences in random order and asked to reconstruct the sentences which corresponded to a specific topic in an organized manner.

During the fifth lesson, students were asked to recall the purpose and provide examples of a topic sentence, transition sentence, and supporting detail sentences. Students then were instructed on the use of concluding sentences. Similar to previous lesson, the teacher explained explicitly the purpose of a concluding sentence and then modeled writing different types of concluding sentences, which included appropriate language use, sentence structure, and syntactic variety. Next, the teacher displayed an expository composition and divided the students into two groups to identify correctly the topic, transition, supporting details, and conclusion sentences in three different examples. Lastly, students used the worksheet from lesson three and asked to individually create a concluding sentence. Feedback was provided to students as a group and individually regarding the quality of concluding sentences.

**Reliability**

A naïve classroom teacher (a second eighth-grade teacher) independently scored 20 students pre-, mid-, and posttest compositions. The naïve teacher was trained in scoring the writing assessment rubric, yet unaware of the experiment. Using the expository writing skills assessment rubric, the second scorer read and rated 35 compositions written by student without disabilities and 25 by student with disabilities. Interobserver agreement was calculated by dividing the number of agreements of scores by the number of agreements plus disagreements of scores and multiplying by 100. Interobserver reliability ranged from 95% to 100%, with a mean of 97% agreement.

**Results**

A repeated-measures ANOVA was used to examine whether there was a relations between the Step Up to Writing (Auman, 2002) adapted program and pre-, mid-, and posttests scores of written expression for 40 eighth grade students with and without disabilities. Five students without disabilities were dropped from the data analysis because of absenteeism during the posttest probe. The level of significance was established at \( p < .05 \). Table 3 displays students’ mean and standard deviation scores across probes. Significant interaction effects of students (students without disabilities and students with disabilities) by time (pre-, mid-, and posttest) occurred \( F(2, 76) = 20.15, \ p < .00 \). When examining pairwise comparisons between group differences across time, students without disabilities (\( M=3.83, SD=1.02 \)) scored significantly higher on the pretest than students with disabilities (\( M=1.79, SD=63 \)), \( p < .00 \). Also, students without disabilities (\( M=3.34, SD=73 \)) scored significantly higher on the midtest than students with disabilities (\( M=3.34, SD=73 \)), \( p < .00 \). However, there was no significant differences on posttest scores between students without disabilities (\( M=4.33, SD=80 \)) than students with disabilities (\( M=4.10, SD=57 \)), \( p = .21 \).

When examining pairwise comparisons of specific student groups across time, students without disabilities scored significantly better from pretest (\( M=3.83, SD=1.02 \)) to midtest (\( M=4.35, SD=60 \), \( p < .05 \). However, there was no significant differences for students without disabilities from midtest (\( M=4.35, SD=60 \)) to posttest (\( M=4.33, SD=80 \)). Overall growth for students without disabilities from pretest to posttest was a mean of .50 (\( SD=1.14 \)).

For student with disabilities, pairwise comparisons across time indicated that they scored significantly higher from pretest (\( M=1.79, SD=63 \)) to midtest (\( M=3.34, SD=73 \), \( p < .00 \). Students with disabilities also scored significantly higher from midtest (\( M=3.34, SD=73 \)) to posttest (\( M=4.10, SD=57 \), \( p < .00 \). Overall growth for students with disabilities from midtest to posttest was a mean of 2.26 (\( SD=70 \)).

Individual student scores were examined further for students with disabilities and students without disabilities. Pretest scores indicated that no students with disabilities demonstrated a competent expository writing score (i.e., score of 4 or higher). After participating in the writing intervention, 84% of the students with disabilities (n=16) demonstrated competent scores on posttests. Only 3 of 19 students with disabilities did not perform competently although their writing scores did improve to a score of 3.5.
Moreover, the percentage of students without disabilities performing competent scores increased from 67% on pretest to 100% on posttests.

### Table 3. Means and standard deviations for groups across pre-, mid-, and posttest.

<table>
<thead>
<tr>
<th>Groups</th>
<th>Pretest</th>
<th>Midtest</th>
<th>Posttest</th>
<th>Growth</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>All student</td>
<td>2.86 (.135)</td>
<td>3.87* (.83)</td>
<td>4.20* (.71)</td>
<td>1.34 (.130)</td>
<td>20.15</td>
<td>.00</td>
</tr>
<tr>
<td>Students without Disabilities</td>
<td>3.83 (1.02)</td>
<td>4.35* (.60)</td>
<td>4.33 (.80)</td>
<td>.50 (1.14)</td>
<td>.02</td>
<td></td>
</tr>
<tr>
<td>Students with Disabilities</td>
<td>1.79 (.63)</td>
<td>3.34* (.73)</td>
<td>4.10* (.57)</td>
<td>2.26 (.70)</td>
<td>.00</td>
<td></td>
</tr>
</tbody>
</table>

*Note. * = significant difference.

### Discussion

The purpose of this study was to examine the effects of an adapted Step Up to Writing (Auman, 2002) program for classroom practice for students with and without learning disabilities. Improvements in the quality of writing emerged after students had received the writing intervention. In pretest analysis, students with disabilities lacked the writing skills of how to create a topic sentence, how to use supporting details, how to use transitions, and how to conclude a composition. In posttest analysis, students with disabilities made significant writing improvements. Students demonstrated the skills of writing a topic sentence, supporting the topic with details, using transitions, and effectively concluding the composition. Moreover, students without disabilities made significant writing improvements from pretest to posttest. For both students with disabilities and students without disabilities, the greatest developments between pretest and posttest compositions were paragraph structure. Essays were organized and themes well developed. Compositions including the presence of an introductory sentence and central ideas were expanded coherently using detailed sentences. Transition and concluding sentences also were exhibited. Moreover, sentence structure and syntactic variety improved. Overall, students wrote expository essays that were qualitatively better, which were generally free from mechanical errors and language misusage.

This study confirmed previous studies that explicit and strategy instructional methods successfully improved students with disabilities written expression (Englert et al., 1991; Graham & Harris, 1993; 1996; 1997; 2000; Graham et al., 1998; Harris & Graham, 1996; 1999; Sawyer et al., 1992; Troia & Graham, 2002; Walker et al., 2005; Wong, 1994; 1997; Wong et al., 1996; 1997). Moreover, this study extends previous research by investigating large-scale classroom practices that included both students with and without disabilities in a inclusive general education classroom.

At the onset of the study, no students with disabilities performed competent writing skills according to the writing assessment scoring rubric. Moreover, 67% of students without disabilities demonstrated competency on the writing assessment. This would have indicated a failure to meet adequate yearly progress under No Child Left Behind (NCLB, 2001). After the writing intervention, 84% of students with disabilities and 100% of students without disabilities demonstrated expository writing competency. Additionally, students were observed applying the expository writing skills and strategies to other assignments and in other classes. Although skill transference was not the focus of this study, teachers in other classes noted that both students with disabilities and students without disabilities writing compositions improved.

However, 3 of the 19 students with disabilities did not improve enough to achieve a competent or passing score according to the evaluative rubric. Although each student increased scores from a 1.0 (deficient) to a 3.5 (progressing to competency) from pre- to posttests, supplemental instruction would be necessary. With that in mind, additional writing practice or a multifaceted writing intervention possibly including self-regulation (Sawyer et al., 1992), guided feedback (Englert et al., 1991, Wong et al., 1996; 1997), handwriting (Graham, Harris, & Fink, 2000), or spelling (Graham, Harris, & Fink, 2002) would be required. Additionally, extended time to write the essay might be an appropriate accommodation.

Many of the students and the teacher reported the writing intervention was beneficial. The teacher noted that the intervention was easy to implement, it was acceptable for improving expository writing, and it
was appropriate for a variety of students. Students reported that the targeted lesson, really help my writing, I noticed a difference right away, and I wish other Language Arts teachers taught this way.

Many middle school students experience frustration with written expression. The abbreviated Step Up to Writing (Auman, 2002) program successfully facilitated improved writing skills among all students. Students with learning disabilities demonstrated the greatest improvements and students without disabilities writing skills were enhanced. Through the use of explicit and strategy instructional methods, the writing intervention assisted students’ skills of idea organization, construction of topic, supporting details, transitions, and conclusion sentences. By assisting students written expression skills, students with and without disabilities successfully composed an expository essay in order to pass the state’s criterion assessment.

Several limitations of this study may have affected the overall results and interpretations. First, students with disabilities pretest compositions were classified as flawed to deficient; therefore other research-based writing interventions may have successfully produced a positive change. Second, the lack of a control group may suggest alternative explanations to improved expository compositions. Although the brevity of the study attempted to control for extraneous variables, without a true control group practice effects could not be parcelled-out. Third, the students were relatively homogenous most of the students who participated were European American males. With this mind, broad conclusions must be cautioned.

Future research is needed to verify the result of this study’s writing intervention. Future research should attempt to replicate these results across different writing compositions (e.g., persuasive, narrative, opinion). Additionally, future research is needed to investigate the long-term effects of writing interventions and possible novelty influences. The generalization of writing interventions across settings and different writing compositions also warrant future investigations. Furthermore, future research is needed to investigate student perceptions of various writing interventions.

References


INCLUSION IN PRACTICE: SOFIA’S SITUATIONS FOR INTERACTION

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University of Gothenburg

The aim of this article is to present findings from a study (Alexandersson, 2007) about how one student—called Sofia— with intellectual disability interacts and communicates with her classmates and her teachers in an inclusive setting. Furthermore, the aim is also to analyse in what way the interaction contributes to Sofia’s social participation and learning process. This complex aim implies a theoretical framework that consists of complementary theoretical perspectives, a sociocultural perspective, a social interaction perspective and a special education perspective. Data were mainly collected through video observations and participant observations. The result from the study shows a continuum of varied situations for Sofia’s learning where she becomes an active participant in the classroom. In general, there are three main categories of situations for learning: One where Sofia is beside the learning activity; one where she is in the learning activity and one where she is moving between to be beside and to be in the situations. In other words; Sofia can place herself in different positions in relation to varied learning situations. How she places herself depends on what support and scaffolding she gets. It is obvious that Sofia’s own actions are of great importance for how successful her interaction will be as well as the affordances given. Sofia’s strategy for interaction and communication with her classmates and her teachers is both verbal and nonverbal. Different bodily expressions in the classroom contribute to how Sofia gets involved in interaction processes. The teachers and the classmates’ roles as mediators of social and cognitive skills are of central importance.

Interaction, Communication and Participation

In special education studies about children with intellectual disabilities and social interaction in preschool and school it is often discussed how children and pupils’ relations appear and in which ways they interact. Ytterhus (2003) shows in her research about the social relations of children, how all children no matter their disabilities always seek friends to play with. She describes how the forced social relations between children with and without differences in preschool are full of ambiguities. On the one hand the children without disabilities want to be with the ones who are different, but not always. On the other hand the different children do not always want to be with the others. Ytterhus concludes that children with disabilities demand a clear response from an interacting partner, but they themselves contribute to some situations becoming ambiguous. Still the children seem to learn to live with the ambiguities and are able to relate to each other as people (2003, p. 181, translation from Swedish).

Other studies about social interaction between pupils with disabilities and the ones without show that what characterizes the pupils with intellectual disabilities and their behaviour on the school yard is that they vary between different attitudes towards different situations—active or passive participation, activities alone or interaction with an adult (Nordström, 2002). Many times they take a between-position, they look, listen and study, turn to the adults nearby or play by themselves. This position becomes the attitude the child with a disability chooses when the number of children, who interact at the same time in different ways, become too many and the difficulty to overlook the situation becomes too much. Nordström (ibid) names this pattern of interactions, partial participation or participation on unequal terms and she means that it is the disability that causes this increase in the participation. Her study shows that when a pupil with a disability does not manage the game or the activity, he or she walks away. The communicative skills limit the participation and give the pupil a minor role which becomes the price the pupil has to pay for being part of an unequal relationship.
In the interaction between children with disabilities, verbal negotiation is minimally manifested (Nordström, 2002). They rarely negotiate about what is to be done, if they have different ideas or different opinions. Solutions like a compromise or an understanding demands skills like understanding, overlooking and communicating, as well as a strategy for argumentation which can be hard to manage for pupils with disabilities. One way to handle the situations is to leave.

Several studies in research about intellectual disabilities focus on participation in different ways (Granlund, Almqvist & Eriksson, 2002; Molin 2004; Szönyi, 2005). The authors maintain that participation means that there is an interaction between the individual and the social and physical surroundings. Both the characteristics of the individual as well as the opportunities given from the surroundings are of importance. Molin (2004) describes two dimensions of participation in the form of one formal – and one informal belonging. To have a formal belonging, to be one in the class, does not necessarily lead to an informal belonging, which is the feeling of belonging and acceptance. Szönyi (2005) uses the terms belonging and partial belonging (cp. Nordström, 2002), but not as fixed positions, but refers to a gliding scale, a continuum.

In the present study of interaction and communication the following situation takes place, when Sofia and her classmates work with a theme.

The children’s task is to draw and paint stores located in the area where they live. Sofia’s group sit on the floor with a large piece of paper in front of them, they are five pupils in the group. The teacher begins by asking the pupils which stores they know. Sofia immediately raises her hand and loudly says, I know. The teacher turns to her and nods. Sofia starts talking about Lidl (a local grocery store). The teacher asks if she uses to shop there, and Sofia answers that she does. The teacher continues to converse with Sofia and wonders if she would like to draw and paint Lidl. She wants to do that. The conversation about stores continues for a while in the group. Then the pupils get crayons and pairs of scissors. Sofia watches the others. She then gets crayons from a classmate. Sofia sits by a table while her classmates are on the floor. When she is finished she cuts her picture out and brings it to the large piece of paper on the floor. She shows her picture and places it on the piece of paper. A classmate moves it and suggests that it should be in another place. No, Sofia says and moves it back. The classmates study Sofia’s picture and talk about it. Sofia listens and watches the classmates. Then we will make a flight of stairs here, someone says. Sofia takes the glue and glues her picture where she wants it.

The situation described here is part of a special education research project with a focus on interaction and communication. The study aims to describe and analyze how Sofia, a girl with an intellectual disability, interacts and communicates in and with her surroundings. By interaction I mean social acts, which are fundamental for how we relate to each other, and the way we create social relationships. In this study I see interactions as a situation, which consists of acts between pupil-pupil and pupil-teacher, where communication (verbal and non-verbal) is a part of and a condition for interaction. In this study communication is used in the widest definition included nonverbal language as body language, gestures etc. Sofia’s communicative skills are limited, which leads to her using non-verbal ways to express herself, contact and interact with others.

Sofia is accepted in the education for pupils with intellectual disabilities, which means that she follows the syllabuses of the education for pupils with learning disabilities, in this case the education for pupils with severe learning disabilities. The education for pupils with intellectual disabilities is according to the Swedish Education Act a form of education for pupils who are expected not to reach the goals in the compulsory school due to a intellectual disability, autism or similar conditions as well as an acquired brain damage (3 chapter § 3). In the education for pupils with intellectual disabilities there are two variations, one for pupils with a lesser to medium intellectual disability, and one for pupils with a medium to severe intellectual disability.

In Sofia’s school there are no special classes for pupils with intellectual disabilities; instead she is educated among other pupils in the same age group in different constellations. This organisational model is a deliberate method in the municipality, where Sofia lives, where school politicians and school leaders want to work for inclusive schools. Through my experiences as a teacher for pupils with intellectual disabilities and as a mentor for teachers who educate pupils with intellectual disabilities in the
mainstream school, my interest and my curiosity has been awoken to what this might mean from a pupil perspective.

The research study focuses on the ways in which Sofia orients herself in the complex world of school. What characterize her interaction and communication and what does this lead to in terms of inclusiveness? During a few weeks when Sofia attends second grade I had the privilege to systematically follow her in her everyday school life, in everything from classes to breaks and eating situations. A description of the research process and analysis of the study with the theoretical and methodological tools used follows below.

Complementary Theoretical Perspectives

The theoretical frame used in this study comes from three related perspectives, a sociocultural - , a social interaction - and a special education perspective. The perspectives’ central terms and their meanings, which are of importance for the study, will be presented in the following.

Firstly, the situation, which is presented in the introduction, shows that Sofia takes part in what is happening depending on how the teacher attends to Sofia, but also how the teacher leads her into work and how the classmates meet and support her. The situation can be understood from a sociocultural perspective with Vygotsky’ (1981) and Wertschs’ (1998) theories of thinking and language theory as a foundation. The form of co-operation which Vygotsky describes requires a pedagogical meeting between pupil and teacher, between pupil and pupil, to which both contributes activity and creativity to the social situation. He clearly stressed the teacher’s importance to the learning process and meant that learning depends upon interaction between people and only through interaction people are able to develop further. How the teacher creates a social environment that develops the actions of the pupil and the possibilities for interaction are of great importance. Therefore it takes an active pupil, an active teacher and an active environment.

Bruner (1996), who coined the term scaffolding, means that the teacher momentarily supports the pupil’s learning, until it grows so strong that the support is not needed anymore. It is about getting an adapted support, support which is adjusted both to the level of the child and the difficulty of the task. It then becomes central to focus on the initiative of the child in the tutoring, so the child manages the situation on its own after a while.

This supporting education, which teachers pursue in the closest zone of development (Vygotsky, 1978) can be described as communicative support, which means to define the problem and create necessary qualifications for learning (Säljö, 2000). Säljö also uses the terms co-operating and co-thinking to illustrate this in a learning situation between pupil and teacher. It is about a kind of co-operation where both parties affect each other and contribute their own abilities and experiences to the situation, and understanding other’s points of view. Sofia’s classmates try to see her point of view when they reason around the picture and its placement. In situations, which are defined by the understanding of others’ point of view, there is a high level of communicative and cognitive coordination.

In a sociocultural perspective, communication and use of language are central terms and the link between the child and its surroundings. It is through communication the individual becomes part of knowledge and skills (Säljö, 2000). Support for learning and development are given through physical and intellectual tools, artefacts, in the surroundings. Säljö uses the term mediating to describe this process. The teacher can be seen as an important mediator, which Feurstein and Klein, among others, describe in their theory of Mediated Learning Experience, MLE (1991). Some of the parameters for MLE are mediation of feelings of competence; mediation of intentionality and reciprocity; mediation of transcendence; mediation of meaning; mediation of challenge and mediation of feeling of belonging. The grownup then works as a mediator between the surroundings and the child. The teacher leads the pupil in the learning process verbally as well as nonverbally, for example through pointing out or in other ways focusing on the same thing. Several of the studied situations in Sofia’s classroom show how the teacher is the one to mediate through questions, focusing and attention (Alexandersson, 2007).

The social interaction perspective that has been a tool in the analysis of the empirical data is Mead’s theory about the forming of the Self through the social interaction with the surroundings (Mead, 1934). The child experiences itself through the special other. The foundation of the theory is that we relate to each other and the surroundings from the meaning the other and the surroundings have to us, which
shows itself through interaction with others. A human being is born to a social world and therefore become somebody, but without getting access to interaction and communication we can also become nobody (von Wright, 2000).

If there is to be a learning process it is necessary, according to Mead (1995), that the pedagogical situation that frames the learning itself is marked by communication. The teaching situation then is a relation where those who are included in it create meaning together. In some ways everybody participates in the social interaction, some more actively, others in what appears to be a more passive way. Maybe the pupil first participates in the periphery through observation and then gradually is included in the activity. To obtain learning an emotional dimension is also necessary, and therefore the teaching must apply to the pupils themselves, their experiences and attention. A taking of point of view is also needed in the teaching. This means a development of the ability to see the other’s point of view by getting to experience variation as a pupil rather than doing the same thing over and over again.

According to Mead the pedagogical meeting is inter-subjective where the intervening space, something that takes place between people, is of great importance. Von Wright (2000) describes two perspectives, punctual and relational, which are of importance to how we understand the subjectivity of the individual. The punctual perspective describes the individual as independent and isolated from the surroundings. Who another human being is can be determined independently from the context. The relational perspective sees human beings in relation to others, which means that the subjectivity of the individual must be understood from the actions, which appear between people in time and space. Here people are participants in the relation and in the social interacting process. From a relational perspective the attention of, for example, the teacher is focused on who the pupil is and who she can be.

Hundeide (2006) argues that an inter-subjective atmosphere must be applied in a classroom, so that children can feel that they can and are counted with. Inter-subjectivity means an emotional climate in the classroom, which is created by intentionality and reciprocity. He also means that everybody needs support in his or her learning. In the situation where the pupils work with stores (described in the introduction) Sofia gets help and support from the classmates. When she stops being active, a classmate gives out his crayons and a pair of scissors and Sofia continue to work. She gets a fast response through insuring nods and then a mutual learning takes place. With individualized working method there is a risk that situations for interaction disappear. Possibilities for mutual learning are lost and important knowledge about other people’s perspective is lost. A group-oriented working method is, in this perspective, important to help those who cannot through their own strength and abilities join the mutual learning, to support and give strategies to qualify as one who takes part and contributes to the group.

Education that rests on communication between a pupil and a teacher is a good breeding-ground for learning. Starting from a communicative relationship-based perspective Ahlberg (2001) shows that participation, communication and learning are linked together in the social practice of the school. What and how a pupil learns depend on a number of different aspects which must be considered at the same time; for example organizational aspects, democracy and equality aspects, socio-cultural aspects, communicative aspects, socio-emotional aspects and didactical aspects all joined together. The interaction between the individual and the surroundings as well as an integrating view on participation, communication and learning are central to this perspective. How we are to understand Sofia’s actions therefore depends both on the social practice and Sofia’s abilities and needs (Ahlberg, 2007).

An Ethnographic Case Study

The main purpose of this study was to describe and analyze situations for interaction and communication with a focus on how a pupil with intellectual disability communicates and interacts in a teaching activity that aims to include her. In this study, ‘inclusive learning activity’ is used, in line with Haug (2001), as an activity characterised by democratic values where all participates in the common goal/community on the basis of each and every body’s condition/prerequisites, which means that context, situations and group affect or interact with one another as well as with the individual person. The focus of the study is on processes in the teaching activity that the pupil is a part of. The study, which is a case study, is ethnographically inspired and the methods for collecting data, which are used (conversations, participating observations, field notes, video documentation) are usually used in socio cultural studies. In case studies a defined group or a specific occurrence is often studied when processes and problems in applied parts of an activity are to be examined (Merriam, 1988). An aim of case studies is to make a clearly defined complex situation understandable. Case studies might be of a describing character, but
are seldom only describing. They often consist of a combination of description, analysis, interpretation and evaluation. In the study at hand there is a combination of description and analysis – a so-called analytical case study (ibid).

An ethnographic study focused on finding meaning in human acts in different situations. The ethnographical element here consists of being present and looking for the meaning of the acts that occur. I assume that Sofia is an active individual who acts according to the situation she finds herself in. How Sofia responds to her surroundings also depends on her own personal resources and intentions, and the nature and outcomes of the meeting is the result of characteristics from both the individual and the surroundings. In a relational perspective the subjectivity of the individual is understood from the actions that come from the relations between people in time and space (von Wright, 2000).

**Video Documentation as a Method**

Video documentation has proved especially valuable in classroom research and ethnographic studies of interaction and communication. Researchers who have studied interaction between disabled children and other children find many advantages with the method (Andersson, 2002; Nordström, 2002; Ytterhus, 2003). One of the advantages of video documentation is that you are able to come back to the same situation during the analysis to find more details or nuances from the material. When creating research data when it comes to studies where interaction processes and communication are the focus the video enables detailed analysis and microanalysis, which are hard to obtain in other ways. Another advantage is that you catch body language and intonation. Since Sofia often uses nonverbal communication video documentation together with participating observations became an important source of information.

There is always a selection of procedure in the documenting process. When a specific process is documented another process is always lost. A video recording can never show the true situation or as Alexandersson (1994, page 81) says the recording cannot catch the width or the depth the way the human senses can. Furthermore, the recording limits aspects and occurrences into a whole. When you use the camera, if it is not stationary, you are somewhat distant; you are outside of the situation. During a number of longer sessions I therefore placed the camera at a certain position and only sometimes adjusted the angle a little bit to be able to focus on Sofia and the situation at hand.

However, there are many other dilemmas to be dealt with when using video documentation. How is it to be used as natural as possible, is it going to interrupt what’s going on in the classroom, how do you place the camera? In which way are the pupils and the staff affected by the video camera? Do the pupils lose their concentration and their focus on what is to take place in the education? How are you going to eliminate or lessen this effect? In what way does the staff react? Does it create stress? Are they going to do things, which they normally would not do: that is, does it lead to unnatural situations? Through letting both the pupils and the staff get used to the video many of these dilemmas can disappear. To make the filming less dramatic the pupils got to film each other and see some sequences I had shot. In the beginning Sofia was a bit reluctant and did not want me to film her. When she too had used the camera and seen herself she did not mind anymore. A letter of consent was sent to the pupils of the class, where both parents and pupil signed and gave their consent or not to participate. Vetenskapsrådet’s, the Swedish Research Council’s, guidelines (1990) were followed in every way. Two pupils, whose parents did not give their consent to video filming, reminded me of this all the time the camera was on. They crawled pass the camera or asked me to turn it off to be able to pass. At the same time they were very interested in what was going on. The teacher helped my filming through placing the two pupils far from Sofia’s desk.

Video documentation can function very well as stimulus, so called stimulated recall, to make it easier for the pupil to narrate what is happening in the class, in the work that is done. To many pupils with a learning disability visual support in communication and interaction is crucial. My experiences of digital pictures and video recordings in education are that pupils in general find it much easier to talk about their actions and thoughts when they see themselves in an experienced situation. Furthermore there is a positive aspect of recognition, which Sofia shows at one occasion when we looked at a filmed sequence and talked about it. Sofia however had trouble seeing and focusing on the picture any length of time and answered my questions very sporadically. Mostly she was focused on herself.
**Data Production and Analysis**

Field notes, which are based on observations, demand a great deal of systematization (Merriam, 1988). In the study at hand observations and video documentation were processed in a similar way. The field notes from the observations were then written on the computer. The video documentation was first transferred to DVD, six hours in all, and transcribed into text. The finished analysis is based on transcripts of both observations and video documentations. The printed transcripts consisted of 55 A4 sheets, of which 35 sheets from the video documentation.

The analysis of the collected material took place in three steps. The first step was to write the whole course of events in different situations, both when it came to the observations and the video documentation. Every situation was named after the activity that took place or where the situation took place, like for example *own work* or *at the special education teacher’s*.

The second step was to select situations which were frequent and contained information which could answer the research questions of the study. Furthermore I looked for variations when it comes to different content of the situations. One aim of this principle of selection was to identify general and typical patterns in Sofia’s interaction and communication so as to be able to create certain representatives in the material. The situations which were selected here were described with support of some key terms so that what characterizes the situation itself appears in an unambiguous way – for example *the teacher initializes interaction, Sofia knocks on the desk, classmate says hello to Sofia*.

In the third step the empirical descriptions from step 2 were related to the theoretical frame and the central terms created for the study. During this analysis process some terms have been reevaluated and new ones emerged. These – both the already chosen and the new ones – were tested against the empirical data. The analysis process therefore meant a movement between empirical data and theory, which gave a sort of woven pattern on the whole (Alvesson & Sköldberg, 1994).

**To be in, between, and beside the learning process**

In the analysis of the study, a general structure takes form concerning Sofia’s *acting and acts* in different situations. This can be considered as quality differences in the interaction pattern between her and the surroundings. There are situations, which show that she participates in what is taking place; she is then a co-creator of the situation. In those situations she gets a clear support from teacher and classmates, and the teacher clearly shows what is going to happen and what the aim of the work is, the teacher functions as a mediator (Feurstein et al, 1991). The situations are characterized by given affordances for interaction and communication and are grouped under the category *To be in*.

In several situations it is however clear that Sofia has a hard time becoming a part of the interaction. She then ends up next to or on the side of the activity that takes place. The social gathering in which she takes part does not encourage interaction despite Sofia’s eager attempts through both verbal and nonverbal expressions. The adapted support fails to appear and the classmates find it hard to understand Sofia’s situation and therefore the reciprocity, which is needed for intersubjectivity, fails to appear. These situations are categorized as *To be beside*.

There are also situations, which indicate that Sofia is on her way to being a co-creator of the interaction situation. Here you notice insecurity and doubt in her actions. It looks like she is having a discussion with herself and wonders if she is going to participate in the interaction or stand at the side of it. She tries to read the situation and understand what is happening, but does not really understand what the classmates are doing. These situations are characterized by her getting an ambivalent or insufficient support for possible interaction. She is in a kind of movement, in a crossroad, toward one or the other interaction pattern. In the analysis this process is named *To be between*.

![Figure 1. Three different interaction patterns](image-url)
The categorizations of the different interaction patterns are in no ways \textit{waterproof}, which means that some of the described situations might be closer to another category than the one they have been placed inside. To be able to communicate the result of the study, three distinct categories have emerged.

In add to the main categories, different dimensions of the three categories developed. An overall dimension concerns interaction, interaction that is classmate related or teacher related. Classmate related or teacher related interaction means that classmates and teacher respectively matter more or less when it comes to how the situation is formed. Another dimension is communication. In the analysis, it became clear that Sofia interacts both through verbal and nonverbal communication with her teacher and classmates. This is central in all the situations but has different importance when it comes to one or another communication form. Since Sofia’s verbal skills are limited other communication forms are especially important to study in relation to her classmates and teacher. Gestures, facial expressions and other body language are what she uses in social interaction. The structure of the analysis work described above is illustrated in the following figure.

\begin{table}
\centering
\begin{tabular}{|l|c|c|}
\hline
 & TO BE IN & TO BE BETWEEN & TO BE BESIDE \\
\hline
Interaction & - Classmate related & - Teacher related & \\
Communication & - Verbal & - Nonverbal & \\
\hline
\end{tabular}
\caption{Analysis structure}
\end{table}

The figure can be seen as a web where the warp consists of the categories To be in, To be between and To be beside of, while the dimensions interaction and communication are the part of the web which are important to how the situations will turn out, that is how Sofia interacts and communicates in and with her surroundings, how and which ways of expression she uses to relate to her classmates and her teacher to become a co-creator of the social practice.

Since Sofia’s actions are the main subject of the study the teacher’s and the classmates’ actions will be less focused on. Naturally both the teacher and the classmates are of importance to the processes, interaction and communication that a single student finds herself in or gets her into, but the focus of the study has been to study Sofia’s strategies for interaction and communication in a school situation. In the analysis you might however say that the teacher and the classmates together with the educational environment are the context in which Sofia’s actions must be understood.

\textit{The Complex Web}

The context of which Sofia is a part offers situations for interaction in different ways. Sofia participates in a variety of social practices. She is for example a part of the whole class, or a group of students, she is with some classmates in the special physical education and she works with the teacher alone. This means that there are different conditions for interaction and communication. When there are more equal conditions (Nordström, 2002) Sofia more easily participates directly. In these situations there is a shared learning through the communicative actions, where Sofia’s own activity as well as the classmates’ or the teacher’s are of importance. When Sofia for example participates in the special physical education with other pupils with intellectual disabilities she varies between being the one teaching and the one learning.

When the conditions are more unequal, it requires support and attention from classmates or teacher. When that is not there, Sofia positions herself on the side of the situation, losing concentration and focus. The following situation is an example of how the situation develops from to be in to beside.

The pupils sit on the floor in front of the teacher. Sofia sits behind them, on the side. The teacher asks about letters and the pupils raise their hands to give suggestions. Sofia looks around and also raises her hand. The teacher acknowledges Sofia and she answers A. That is wrong; the teacher says and turns to another pupil. Sofia again raises her hand, looking attentively at the blackboard and the teacher. She eagerly waves her hand. She gets to answer again and says A. You already
said that, says a classmate. It does not matter, many of you have said the same letter twice, the teacher says. Sofia turns her eyes away from the blackboard and the game. She starts to twiddle her fingers. She looks away, looks around and moves away from the classmates.

When it takes a certain amount of arguing for Sofia to assert herself, it is also hard to interact, which can be the reason for Sofia to sometimes give up and close down all interaction. In an independent work situation Sofia’s work is interrupted when another student sitting next to her suddenly takes the pair of scissors from her without commenting. She sighs and looks at him, but says nothing. She looks out of the window and waits.

In this sequence of the situation no verbal negotiation or argument takes place, and instead Sofia become subordinate and waits. But she manages to communicate through her sighing, which draws the attention of the classmate.

The classmate sees that Sofia is waiting and quickly returns the pair of scissors, knocking her shoulder and showing her the pair of scissors. Sofia continues to use them. The classmate comments on her work, good, that is right, and points when she stops.

The situation on the whole is an example of how a movement takes place between to be in and being beside of and then participating again with the support of the classmate. The interaction pattern is characterized as being between.

The more unequal conditions might, on the other hand, become a challenge and lead to an expansion of the pupil’s learning. Through challenging the pupil in a situation of shared learning with important peers, with the help of suitable support, (Bruner, 1996) and mediating (Feuerstein, 1991 & Säljö, 2000) the pupil is given the tools to develop faith in his or her own abilities and better self-esteem. These factors in their turn affect the participation in the school situation (Eriksson & Granlund, 2004). Sofia is involved and a part of what is taking place within the context of the class to a lesser or greater extent. She can be said to be socially participating as well as participating in a more or less task-oriented way. Other situations, like when the class come together, shows that Sofia’s participation can be expressed in terms of social gatherings (Ytterhus, 2003) or formal belonging (Molin, 2004). She is then physically and spatially together with the others in the class, which can be seen as a condition for participation.

The study shows that there are a variety of situations that offer different conditions for interaction and communication. This in its turn leads to a greater or lesser degree of participation, which is one of the main results of the study. An important and clear condition for participation is that the teacher sees the pupil that is really close to the pupil in both a social and didactical sense. In several of the situations in the category To be in the teacher is the one who invites Sofia into the interaction. This does not mean that the teacher is the one who always gives the direct support; she can also stand by the side of the pupil and wait for a direct action from the pupil. You could say that the teacher moves between two positions in relation to the pupil; one where the teacher interacts actively and one where the teacher interacts passively. By passive I mean a conscious tactic from the teacher that is meant to encourage a direct action from the pupil. The teacher’s seemingly passive act is therefore really pro-active; it is supposed to encourage action from the pupil. According to Vygotsky (2001) it is essential to make the pupil participate by expecting activity. The teacher’s or the adult’s task is to support independent actions within the closest development zone. It is in this way that conditions for interaction are created for Sofia and classmate interaction.

It is in relation to others and the surroundings that Sofia’s actions and subjectivity must be understood. The relational perspective described by von Wright (2000) means that to be able to see who another human being is one needs to experience a meeting as well as a sense of relation to the other. Without such a relation, according to von Wright the human being is reduced to becoming a What, that is the human being is attributed with general characteristics without a possibility for the uniqueness to come through. In this study I am, after my meeting with Sofia, letting her unique course of action stand out in comparison with the classmates.
The result of the study can be seen as a contribution to the discussion about the need of special classes for pupils with intellectual disability because it shows the potential for possible interactions and a range of conditions for handling diversity in the mainstream school. One of the conditions then is that the teacher has the ability to see who the pupil is. Only then the teacher can support and stimulate the pupil so that she by herself can and dares to express herself. At the same time the teaching must allow for a variety of interaction situations to be able to fulfil every pupil’s need for social interaction. Sofia is given an opportunity to participate and take part in different situations based her needs and conditions within a school system that is supposed to include all pupils. I argue that Sofia’s school in different ways offers solidarity, interaction, mutuality and participation, which according to Haug (2001) define an inclusive school system. This is the most important conclusion of the study, which can be generalized and be applied to school situations in general, that is to all children/pupils and thereby be a guide for educators and teachers.

**Concluding Remarks**

In this study the aim has been to describe and analyze parts of Sofia’s everyday school life. By going into her world and be there through her everyday school life it has become possible to reach an understanding and get insight into the context Sofia belongs to. When representing this as accurately as possible and by describing the methods used, qualifications for credibility are created, which is an important criterion for the quality of a study (Merriam, 1988). Among other things this applies to the selection of situations. Are there situations, which haven’t been seen; and would the results be different if this data was collected at some other time? Of course this is the case but by thoroughly describing the research process the trustworthiness and the factuality aspect can be fulfilled. In ethnographic studies you talk about empirical generalization. The researcher then reflects upon his or her population that you try to generalize (Hammersley & Atkinson, 1995). This study however is not meant to draw generalizations from, but is an attempt to take a student perspective and contribute to an understanding on how a student with a learning disability orients herself in the practice of school in the situations and contexts, which have been studied. What the student communicates and participates in also dependent on which other students act within the context. In another context the student probably is offered other interaction and communication possibilities.

Taking a pupil perspective is not without problems. No matter what theoretical starting points or methods are used within such perspective it is never possible to experience the world in the same way the subjects studied experience their world. One can only describe the experiences made by Sofia in her everyday school life as credibly as possible. Those are my experiences of Sofia’s possible experiences.

Only one student is focused upon in the study, which of course limits the possibility to make general assumptions. Is it possible to make general assumptions based on Sofia’s interaction and communication with other students, other students with learning disabilities? Maybe not, but it is still possible to see a pattern in how the school and the teachers of the school create opportunities for participation and learning in a variety of interactive situations based on the needs of the pupil.

The study here presented is a single-case design study and it refers to a family of research designs. Single-case design offers an alternative strategy to the more usual methodologies based on between group designs (Polit & Beck, 2008). Single-case design is idiographic rather than nomothetic (Kazdin, 2001) and there are two major types of single-case designs; case study and single-subject experimental designs. In the present study the case study design were used. It is an intensive and idiographic description and analysis of a single individual (Sofia in the present study). The unique feature of single-case designs is the capacity to conduct investigations with the single case, that is, one subject or one group. Typically, observations are conducted on a daily basis or at least on multiple occasions each week to produce data about the single individual. However, a limitation is the extent to which the results with one single individual can generalize to others not included in the study. But, the limitation of single-case designs is not generality of the effects but identifying the dimensions or categories which may influence the extent to which the intervention exerted impact (Kazdin, 2001). Single-case designs have been used extensively in educational settings, from preschool through college. There is a special role for these designs in schools because school is often a place in which diverse programs are implemented and at different levels (Kennedy, 2005; Riley-Tillman & Burns, 2009). The single-case, here presented, was a possible challenge to theoretical assumptions about inclusion.
References
INSIDER, OUTSIDER, ALLY, OR ADVERSARY: PARENTS OF YOUTH WITH LEARNING DISABILITIES ENGAGE IN EDUCATIONAL ADVOCACY

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The purpose of this qualitative study was to examine the educational advocacy experiences of parents of adolescents and young adults identified as having a learning disability (LD) through the lens of four dimensions of advocacy. Seventeen mothers of youth with LD responded to items in a questionnaire and 13 also engaged in in-depth interviews. It was found that the dimensions of advocacy provided a useful framework for understanding the participants’ experiences and parents could be categorized as insiders, outsiders, allies, and adversaries with different advocacy outcomes.

Advocacy is defined as taking one’s own or another’s perspective to obtain a result not otherwise available (Turnbull & Turnbull, 1997, p. 294). It occurs any time people speak or act on behalf of themselves or others and involves presenting, supporting, or defending a position (Alper, Schloss, & Schloss, 1995 p. 265; Turnbull & Turnbull, p. 297). In a recent study on the school experiences of adolescents with fetal alcohol spectrum disorder, four dimensions of parent advocacy emerged (Duquette, Stodel, Fullarton, & Hagglund, 2011b). The purpose of this study was to explore the educational advocacy experiences of parents of adolescents and young adults with learning disabilities (LD) with a view to extending the scholarship on parent advocacy by examining the phenomenon through the lens of the four dimensions.

Parents of children and youth with special needs have a formalized role that is enshrined in special education legislation across North America (Individuals with Disabilities Education Act of 1990 and its reauthorization in 1997; provincial legislation in Canada). They have a right to be involved in the decision-making process about their children, and it is expected that parents and school personnel will work as partners (Brown, Sigvaldason, & Bedner, 2005; Turnbull & Turnbull, 1998) in developing Individual Education Plans (IEPs). However, noted in the literature is that it is not typical practice for school personnel to invite parents to discuss issues related to the development of an IEP (DeFur, Todd-Allen, & Getzel, 2001; Thoma, Rogan, & Baker, 2001). Childre and Chambers (2005) argue that when parents are not involved in educational planning, the supports identified for the students may be inadequate. Not surprisingly, some parents want to have their voices heard in the decision-making process about what accommodations, programs, and services are provided by the school (Waggoner & Wilgosh, 1990). When they realize they have rights, that accommodations can help their child succeed, and that there are limits to resource allocations, many parents begin to advocate (Alper et al., 1995; Heiman & Berger, 2008). They are imbued with the sense that their advocacy will improve the quantity and quality of services delivered to their individual child (Gross, 1996; Heiman & Berger, 2000; Wang, Mannan, Poston, Turnbull, & Summers, 2004). Moreover, unless they feel supported by a teacher or school administrator, parents feel they are their child’s only advocate (Wang, et al., 2004). The research shows that parents want to develop a partnership with the school that is based on open communication (Grove & Fisher, 1999; Hess, Molina, & Kozleski, 2006; Stephenson, 1992). Alper et al., (1995) identify communication with the educators as an important element of interpersonal advocacy, one of the four types of advocacy they propose.
The four categories proposed by Alper and her colleagues (1995) included self-advocacy, social support advocacy, interpersonal advocacy, and legal advocacy. They contend that interpersonal advocacy involves interactions by family members, professionals, or others on behalf of the child or youth with disabilities. This type of advocacy occurs most frequently through formal and informal communication and is the starting point for addressing the inequities of educational resource allocation on an individual basis. Formal communication occurs at specific times of the year, such as during the report card meetings and the annual review of the IEP. Informal communication is on-going and serves the purpose of preventing minor problems and developing trusting relations (Stephenson, 1992). Parents may communicate informally by sending a notebook to and from school or by making telephone calls to the school to ensure that there are no minor problems. They also informally educate the teachers about their children’s exceptionality and help out in the classroom (Grove & Fisher, 1999). Building a positive relationship with the people who are responsible for providing the supports and accommodations for their children within the school setting is seen as important by parents (Hess, Molina, & Kozleski, 2006). Hence, continual communication is an important element of interpersonal advocacy that lays the foundation for an effective home and school partnership.

Dimensions of Advocacy

In a study involving the adopted parents of adolescents and young adults with fetal alcohol spectrum disorder (FASD) (Duquette, et al., 2011b), open communication was also noted as an important element of parent educational advocacy. However, it was shown in this research that educational advocacy may be viewed as having four dimensions that are awareness, seeking information, presenting the case, and monitoring. In the first dimension, awareness, parents became aware that their children were developing or functioning at an academic or cognitive level that was different from their peers through their own observations or reports from teachers. Parents may also have been informed of behaviour problems that were occurring at school. The second dimension is seeking information which involved learning more about the child’s strengths and weaknesses through a formal assessment, the exceptionality named in the diagnosis, special education policies, and programs offered by the local boards of education and private schools. The most popular sources of information were websites (parent support groups and the boards of education), other parents, and printed resources (e.g., books, pamphlets, and articles). In the third dimension, the parents were engaged in presenting the case to educators. Their arguments for accommodations, resources, or special class placements were based on the formal assessment and they sometimes brought lawyers or trained advocates to help them argue their case. Other activities in this dimension included developing the IEP, attending the report card meetings and the yearly reviews. Informally, parents also tried to maintain open lines of communication and educate the teachers on their children’s exceptionality and needs. In addition, some parents also lobbied politicians for programs and services. The fourth dimension is monitoring and the main task of the parents was to ensure that the accommodations listed in the IEP were provided. Parents kept an eye on their children’s academic progress and how their children were feeling about school. If they were not doing well or were feeling frustrated, it might have been because the required accommodations were not being offered. Once parents became aware of potential problems, they sought further information and presented the case again to the school for the provision of the required accommodations.

In another study using the dimensions of advocacy with 17 parents of students identified as intellectually gifted, it was found that these dimensions are not discrete stages that a parent moves through in a lockstep pattern (Duquette, Orders, Fullarton, Robertson-Grewal, 2011a). As the initial process of identification, placement, and programming occurred at the school, parents assumed more of the activities of each dimension of advocacy without shedding any of the activities from the previous dimensions. Hence, it was possible that parents were performing tasks in all four dimensions simultaneously. However, this framework needs further testing with parents of children with other exceptionalities. Therefore, it was the purpose of this research to determine if the advocacy tasks performed by parents of adolescents and young adults with learning disabilities could be categorized according to the dimensions of advocacy.

Method

In this qualitative research the parents of adolescents and young adults with learning disabilities described their experiences as educational advocates within publicly funded boards of education in the Province of Ontario. In the next sections the methodology used in this study is described.
Participants
The participants consisted of 17 birth mothers of adolescents and young adults identified as having a learning disability who responded to an announcement placed on the website of the Learning Disabilities Association of Ontario. The selection criteria were that their child had to have a diagnosis of a learning disability and be enrolled in a high school or have recently graduated from secondary school. Six of the participants’ children had a diagnosis of LD, seven had a dual diagnosis, three had a triple diagnosis, and one had a quadruple diagnosis. They were most often assessed with attention deficit hyperactivity disorder and/or giftedness in addition to learning disabilities. The adolescents and young adults were either in high school (9/17) or had graduated (8/17) and ranged in age from 14 to 27 years (see Table 1). Only one child had failed a grade (#9) and another youth left school without graduating (#1). There were 13 males and 4 females. Most of the parents indicated that they became aware that there were problems in the academic progress of their son or daughter in elementary school and they all had been advocating ever since.

Table 1. Characteristics of Adolescents and Young Adults with LD

<table>
<thead>
<tr>
<th>Person</th>
<th>Sex</th>
<th>Age</th>
<th>Highest grade</th>
<th>High school placement</th>
<th>Parents aware</th>
<th>Diagnosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>M</td>
<td>20</td>
<td>Gr. 11 (working)</td>
<td>Special class</td>
<td>High school</td>
<td>LD</td>
</tr>
<tr>
<td>2</td>
<td>M</td>
<td>25</td>
<td>Gr. 13 (university)</td>
<td>Private school</td>
<td>7 yr.</td>
<td>NVLD, gifted</td>
</tr>
<tr>
<td>3</td>
<td>M</td>
<td>15</td>
<td>Gr. 10</td>
<td>Regular class, basic level</td>
<td>6 yr.</td>
<td>LD, language disorder</td>
</tr>
<tr>
<td>4</td>
<td>F</td>
<td>16</td>
<td>Gr. 11</td>
<td>Fr. Immersion +accommodations</td>
<td>Gr. 2</td>
<td>LD, ADHD</td>
</tr>
<tr>
<td>5</td>
<td>F</td>
<td>27</td>
<td>Gr. 13 (university)</td>
<td>Regular class +accommodations</td>
<td>Gr. 3</td>
<td>LD</td>
</tr>
<tr>
<td>6</td>
<td>M</td>
<td>17</td>
<td>Gr. 11</td>
<td>Regular class +resource support</td>
<td>Kindergarten</td>
<td>LD, CAPD</td>
</tr>
<tr>
<td>7</td>
<td>F</td>
<td>25</td>
<td>Gr. 12 (university)</td>
<td>Private school</td>
<td>6 yr.</td>
<td>LD, ADHD, Scotopic sensitivity syndrome</td>
</tr>
<tr>
<td>8</td>
<td>M</td>
<td>15</td>
<td>Gr. 10</td>
<td>Regular class +accommodations +resources support</td>
<td>Kindergarten</td>
<td>NVLD, gifted</td>
</tr>
<tr>
<td>9</td>
<td>M</td>
<td>16</td>
<td>Gr. 9</td>
<td>Adaptive high school program</td>
<td>3 yr.</td>
<td>LD, speech &amp; language disorder</td>
</tr>
<tr>
<td>10</td>
<td>M</td>
<td>14</td>
<td>Gr. 8</td>
<td>Regular class</td>
<td>Kindergarten</td>
<td>LD</td>
</tr>
<tr>
<td>11</td>
<td>M</td>
<td>15</td>
<td>Gr. 9</td>
<td>Regular class +accommodations +resource support</td>
<td>Kindergarten</td>
<td>1 yr.</td>
</tr>
<tr>
<td>12</td>
<td>F</td>
<td>24</td>
<td>Gr. 12 (working + college)</td>
<td>LD class</td>
<td>Kindergarten</td>
<td>LD</td>
</tr>
<tr>
<td>13</td>
<td>M</td>
<td>19</td>
<td>Gr. 12 (college)</td>
<td>Regular class</td>
<td>Gr. 4</td>
<td>LD, ADHD, anxiety, Scotopic sensitivity syndrome</td>
</tr>
<tr>
<td>14</td>
<td>M</td>
<td>18</td>
<td>Gr. 12 (university)</td>
<td>IB program to Gr. 11, regular class for Gr. 12</td>
<td>High school</td>
<td>LD, ADHD, gifted</td>
</tr>
<tr>
<td>15</td>
<td>M</td>
<td>14</td>
<td>Gr. 8</td>
<td>Regular class +accommodations</td>
<td>Gr. 2</td>
<td>LD</td>
</tr>
<tr>
<td>16</td>
<td>M</td>
<td>21</td>
<td>Gr. 12 (university)</td>
<td>Regular class +accommodations</td>
<td>Kindergarten</td>
<td>LD, ADHD, gifted</td>
</tr>
<tr>
<td>17</td>
<td>M</td>
<td>15</td>
<td>Gr. 9</td>
<td>Regular class +accommodations</td>
<td>Gr. 3</td>
<td>LD, ADD</td>
</tr>
</tbody>
</table>

Data Collection
Data were collected through questionnaires and individual interviews. The questionnaires consisted of open-ended items related to the four dimensions of parental advocacy, the assessment process, and the school experience of their children (see Appendix A). Participants were invited to be involved in an in-depth interview to discuss their advocacy experiences further (Marshall & Rossman, 2006). Thirteen of the mothers told their stories in semi-structured interviews that lasted about 60 minutes each. During that time, they were asked to elaborate on the questions to which they had responded in the questionnaire (see Appendix B). A transcript of each interview was prepared and sent to the participant for approval. A few
of the participants corrected the grammar and added more details to the transcripts and only approved transcripts were used in the analysis.

Data Analysis
The quantitative data were analyzed descriptively; however, most of the data were qualitative and were analyzed inductively. The data from the interviews and open-ended questions were read repeatedly, text was underlined, and notes were made (Miles & Huberman, 1994). They were organized into five categories of which four were the dimensions of advocacy. The fifth was the school experiences of the sons and daughters of the participants. The responses to the questions in each category were coded and examined for patterns that emerged as sub-categories. The categories and sub-categories are shown in Table 2. The data in the sub-categories assisted the researchers in understanding the school experiences and the specific activities performed by parents in each of the dimensions. The constant comparative method was used to saturate the sub-categories and interpretations were made using inductive reasoning (Patton, 2002). The analysis was done by hand to facilitate engagement with the data (Charmaz, 2000).

<table>
<thead>
<tr>
<th>Category</th>
<th>Sub-Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>Awareness</td>
<td>Mothers observed delays in language, trouble learning, anxiety and depression, similar characteristics in older siblings</td>
</tr>
<tr>
<td></td>
<td>Teachers observed academic difficulties</td>
</tr>
<tr>
<td>Seeking information</td>
<td>Psychological assessment, LD, policies and procedures</td>
</tr>
<tr>
<td></td>
<td>Mostly websites (support groups, Ministry of Education)</td>
</tr>
<tr>
<td></td>
<td>Frequency: continually or when there was a problem</td>
</tr>
<tr>
<td>Presenting the case</td>
<td>Formal meetings sometimes with education advocates but not lawyers</td>
</tr>
<tr>
<td></td>
<td>Informal meetings – inservice the teachers, open communication, volunteering</td>
</tr>
<tr>
<td></td>
<td>Elected as a trustee</td>
</tr>
<tr>
<td>Monitoring</td>
<td>Children’s feelings about school, academics</td>
</tr>
<tr>
<td></td>
<td>School’s implementation of the IEP</td>
</tr>
<tr>
<td>School experiences of the Youth</td>
<td>Strengths, needs, and accommodations</td>
</tr>
<tr>
<td></td>
<td>Factors contributing to success</td>
</tr>
<tr>
<td></td>
<td>Factors hindering success</td>
</tr>
</tbody>
</table>

Trustworthiness
To establish the quality of the study, the researcher must describe indicators that provide evidence that the information generated in the research is trustworthy and believable (Freeman, deMarrais, Preissle, Roulston, & St. Pierre, 2007). The indicators in this study were credibility and transferability. Researchers seek to ensure that there is a correspondence between how the participants view the phenomenon and how they interpret the comments of the participants (Guba & Lincoln, 1989). Credibility was established by doing negative case analysis and member checks. Transferability refers to the extent to which readers assess the findings consistent or potentially consistent with their own experience or settings (Miles & Huberman, 1994). Transferability was enhanced by presenting much of the data supporting each category and sub-category, which would assist the readers to link the findings to their own situations. Additionally, the data were analyzed independently by the researchers, who were in agreement with the findings (Mertens, 2005).

Findings
The findings of this study are reported in this section and they were organized under three broad headings: school experiences of the youth with learning disabilities, the educational advocacy activities of the parents, and reflections on the advocacy experiences. The sub-section on reflections consists of major points about advocacy that were beyond the scope of the four dimensions.
School Experiences of the Adolescents and Young Adults with Learning Disabilities

The data demonstrated that many of the adolescents and young adults were or had been in regular high school classes with accommodations and only two were placed in a special class or school. The participants’ comments indicated that their children’s academic problems were in reading and written expression and that the arts and athletics were areas of strength. According to the parents, the factors contributing to the academic success of these students with learning disabilities were individual characteristics, parents’ actions, and institutions’ actions. Individual characteristics identified by the mothers that contributed to success were their children’s work ethic, determination to succeed, empathy, and caring nature. The participants also stated that their own actions were linked to the academic outcomes of their children. Specifically, at the school level they advocated for accommodations and at home they provided tutors (science, math, and English) and assistance with assignments. They also tried to develop their children’s areas of strength through extracurricular activities. The actions taken by the institutions were the final contributing factor to academic success and the provision of accommodations was viewed as very important by the parents. The most common accommodation was extra time for exams and assignments, and six of the youth also had access to assistive technology, such as a laptop computer and Kurzweil reader. Additionally, at the school level, a few great teachers were acknowledged by participants in helping their children succeed.

Parents also identified factors that hindered success, such as the individual characteristics of their children (e.g., refusal of accommodations and assistance and their children’s shy and anxious nature). Actions taken by schools were also cited as a barrier, such as a late or incorrect identification which in turn limited access to appropriate programs and accommodations. A participant explained that her son did not receive a proper diagnosis [from the board of education] and was not properly supported in the school system. She added, If he had had the help beginning in the early years, he would not be as disabled as he is now. It was also noted by a few parents that boards seemed to have difficulty supporting children with a dual diagnosis, such as a learning disability and giftedness. Other actions at the institutional level noted by parents were teachers who did not understand learning disabilities, did not follow the IEP and give accommodations, or had low expectations. These factors that hindered success were linked by parents to the withdrawal from high school by one adolescent and suicide attempts by two others. No parents identified factors related to them that hindered the academic outcomes of their child.

Dimensions of Advocacy

In the next sections the findings on educational advocacy are presented. The data were categorized according to the four dimensions of advocacy and are described in turn.

Awareness. A few mothers noticed delays in receptive and expressive language when their children were preschoolers, but most of the participants stated that they became aware that their children may have a learning difference during elementary school. Some mothers observed that their son or daughter was having trouble learning and completing work in the primary grades, and about half of the participants reported that it was a teacher who informed them about problems in reading and math. Other mothers saw the signs of a learning disability when their children began elementary school because it was their second child and they knew what to look for. However, two mothers stated that they only became aware that there were problems when their sons were in secondary school. One of these parents wrote, He began shutting down in class and at home…. [He had] terrible nightmares and refused to go to school. Another mother explained that she became aware that her son may have a disability through her own observations and a suggestion by a teacher:

So I kind of put these together in my head, The child is struggling, extremely frustrated, depressed, withdrawn, not happy, and we have these unexplainable issues. And then when the school said, Well why don’t you get tested, I said, Okay, let’s go.

In sum, parents generally became aware that their children may have a learning issue in elementary school, and this was mostly due to lags in academic achievement. For parents whose children were not identified as having a learning disability until high school, it was the awareness of emotional issues related to school that lead to an assessment.

Seeking information. All but one parent sought information on their child’s strengths, weaknesses, and how he or she learned. Many participants indicated that they thought a psychological assessment in which a formal diagnosis was indicated would be the first step towards obtaining appropriate
programming for their children. One parent stated, *I thought that if my son got the diagnosis he would receive the necessary help and the school would put him in the right place.* Most participants sought an assessment from a psychologist in private practice rather than the school board because it was felt that *parents must substantiate their child’s needs from sources outside of the school board.*

Before the first meeting with school personnel to discuss the assessment, parents developed their procedural knowledge of the school system. The mothers sought information on their board of education’s special education procedures, the range of program options offered by the board, home schooling, and the Ministry of Education policies. They also looked for information about learning disabilities to gain a deeper understanding of them, and as one mother said, *You’ve got to be knowledgeable because it’s a complex area.* Most of the information came from websites (e.g., the Learning Disability Association), parent support groups, and informal parent sharing. Many mothers stated that they still seek information continually and a few indicated that they look for information only when there is a problem. A mother observed, *You know, there’s always another issue and another problem. And there are always changes in philosophy and policy, and it’s so time consuming to keep on top of all those sorts of things.* The participants learned that the task of seeking information is a huge and constant challenge. One mother who was also a board trustee explained, *Information does not come willingly from the school personnel …the process is not parent friendly; [it’s] very passive aggressive.* Hence, the parents in this study devoted time to doing their own research to find the information they needed to argue for the needs of their children.

*Presenting the case.* About half of the participants expressed difficulty convincing the school personnel that their son or daughter had a learning disability and required specific accommodations. However, a thorough report from a psychologist established the diagnosis and learning needs of the child. For the first meeting in which the psychological report was discussed, seven participants stated that they brought a psychologist or education advocate with them to argue their case. As noted by one mother, *professionals are necessary to explain and testify to the child’s needs.* Another participant wrote she had no trouble convincing the board of education of her child’s needs because *The report was extremely thorough (26 pages) and I had an LD advocate with me.* Education advocates from the support groups were invited by parents to attend the school meetings to *ensure that the IEP was a true reflection of [the child’s] needs and to support the parents during this emotional time.* Interestingly, two of the mothers in this study had accompanied and supported other parents at these meetings. One of these participants was a psychologist and the other an educational advocate. Among parents who had sought support in presenting the case, the feeling was that it was generally helpful. A participant later regretted not inviting an advocate. She explained, *I naively thought that I did not need one as I trusted the school board.* I was wrong.

Most of the other parents commented that they had either considered inviting professionals or education advocates to the meeting but did not. A few mothers had someone review the IEP before the meeting and decided against inviting a support person. One parent explained, *I had an LD advocate review the IEP and was told it was a good IEP.* Another parent was a psychologist who understood the professional’s report and the IEP, and she felt comfortable making the case on her own. The parents in this study did not recommend bringing a lawyer to any of the formal meetings with the school or board personnel. One mother’s comment summed up the general feeling, *I do not feel lawyers belong at the [school level meeting].* It appeared that participants recognized that polite persistence with the people who were ultimately going to provide supports for their children was a better strategy than the threat of legal action.

All of the children had an IEP and the role of the mothers in preparing the first one ranged from no participation at all to actually writing it with the teachers. After the first IEP was written, parents continued to present their case for accommodations to individual teachers. Some mothers commented that they consistently had to remind the teachers of the need for accommodations at the yearly meetings when the IEP was reviewed. Many mothers also met with teachers at the beginning of each semester to go over the needs and accommodations for their children. Almost all of the participants indicated that it was also their role to educate the teachers about learning disabilities and the strengths and needs of their own children. A participant commented, *Many teachers were ill-informed about learning disabilities.* In response, they provided teachers with printed and electronic information, such as articles, pamphlets, and websites. Parents reported that meeting with teachers and providing them with information was necessary to raise their awareness of the needs of their sons and daughters, which they hoped would prompt the teachers to provide the much-needed accommodations.
For seven of the mothers, arguing the case also meant engaging in political action that involved phone calls and letters to trustees, superintendents, their board’s Special Education Advisory Committee, Members of the Legislative Assembly, and the Ministry of Education. Additionally, as a result of their experiences making the case for their children, two of the participants were motivated to become trustees in their respective boards of education, which afforded them information and influence. One mother stated, *I ran for and was elected to the Board of Education when my daughter was in grade 6. I sat on and chaired the Special Education Advisory Committee. Through this I was very aware of my rights and the resources available.* Her position within the board, not only gave her access to information, but helped her garner the respect of teachers working with her daughter. When teachers had not read the child’s file and were not providing the required accommodations, her questioning as a trustee and not as a parent prompted them to do so.

At times many of the mothers in this study seemed to be fighting an uphill battle with the schools about their children’s need for accommodations. However, they persisted because they believed that their children’s academic success depended on them presenting the case for accommodations that were vital to learning. One mother noted that this role was *time consuming and exhausting.*

**Monitoring.** Many mothers felt that teachers were not always willing to communicate to parents about the accommodations they are actually providing to their children. The concern was that it is *difficult to know if the IEP is being implemented without monitoring* because teachers are not transparent about this at all. Another mother stated that parental involvement and monitoring are necessary because you *cannot assume that your child is having success.* To gauge if the accommodations were being implemented and if the children were doing well at academically, all of the mothers in this study monitored how their children were feeling about school. One mother commented that *if your child is unhappy, she will not do well in school.* They also indicated that they regularly monitored the academic progress of their son or daughter *because no one else will if I do not.* Some parents also wanted to keep their children’s names fresh in the minds of teachers so that they were not forgotten or overlooked, particularly if the child was quiet and posed no behavioural problems. Parents believed that monitoring had to occur regularly and at the beginning of each semester because *if you wait until report card time, it’s too late.*

For most parents monitoring involved talking to their child and communicating with the teachers at school with the hope of influencing their behaviours. However, having political clout reduced the amount of monitoring required at the school level. One mother who was a trustee was able to use her influence with teachers *who couldn’t be bothered* to read her child’s file and provide the accommodations listed on the IEP. With a single phone call, accommodations were in place. As shown, the participants in this study were conscientious mothers who monitored the situation at school to ensure that their children received the accommodations listed in the IEP and that school was a positive experience for their sons and daughters. As one mother explained, *He doesn’t receive what is stated in the IEP unless we continually advocate.*

**The Advocacy Experience**

A theme that emerged from the data was the mothers’ reflections on their advocacy experiences. Thoughts on the outcomes of advocacy, sources of information and support, and advice for other parents are presented. The participants indicated that despite the frustrations in working with the board of education and the schools, there were rewards for their advocacy efforts. All but one of the young adults had graduated from high school and all had enrolled in postsecondary education or were employed. Additionally, the adolescents who were still in school were academically on track to graduate. Over the years the participants found that the Internet was their most important source of information about learning disabilities and special education policies and procedures. The mothers also reported that support from others, such as parent groups had sustained them during the more challenging times. The few teachers who understood learning disabilities and were willing to assist were another source of support for them. One mother stated, *This last [resource] teacher has been really helpful by just taking an interest in my son.* Another source of comfort for some mothers was their own son or daughter, *realizing his strengths – he is responsible and creative.*

These mothers also had advice for other parents. They unanimously agreed that parents must advocate for their children in order to obtain accommodations and resources for their children. A mother who became a trustee stated,
Advocacy was seen as a long-term commitment requiring an ongoing investment of time, effort, and often money. Participants also advised other parents to provide emotional support for their children. Believe in their abilities even when they are struggling. It doesn’t matter how hard something is for them, let them know they can do it. ... Once confidence is lost often motivation is lost with it, especially with a child who struggles with a learning disability.

Participants further advised parents to build an alliance with the school so that teachers would be willing to provide accommodations. One parent stated, I was supportive of the school and its staff and program, volunteering extensively. Because of this, teachers were willing to help me. This statement reflects how dependent parents and children are on the good will of teachers to provide a supportive environment and the importance of becoming an ally. Hence, they cautioned other parents against taking an adversarial stance with the school: Be an ally not an adversary. Their final piece of advice was never give up.

Discussion
In the present study, the educational advocacy experiences of parents of adolescents and young adults diagnosed with learning disabilities were explored using the lens of four dimensions of advocacy. The findings demonstrated that the participants’ advocacy activities could be categorized according to the four dimensions. Consistent with previous research on the dimensions of advocacy, once these parents began advocating, they quickly became immersed in it and were performing tasks in all four dimensions simultaneously (Duquette, et al., 2011a). These participants also perceived learning disabilities as a difficulty that requires accommodations in order for the child to succeed (Heiman & Berger, 2008). As well, they were aware that their advocacy improved their children’s chances of obtaining the accommodations and supports that met their children’s needs (Gross, 1996). It was also understood that they were responsible for their child’s progress in school and were sometimes their children’s only advocate (Wang, et al., 2004). As shown in other studies, it was mainly the mothers within the family unit who were involved in the educational advocacy efforts (Lareau, 2002; Traustadottir, 1991).

A difference between these data and the findings of previous research with the dimensions of advocacy is that some of the participants entered the political arena. Not only were they able to speak to the needs of all students with special needs in their district, their political clout ensured that their voice was heard when they presented the case for their own children. As trustees working within the organization, they knew their rights and had access to information about resources. With this information they were able to influence the outcomes of the formal meetings with educators and ensure that IEPs were read and followed. There seemed to be a certain sense of accountability to a trustee that was not afforded to other parents. Mothers who were trustees were the insiders.

Most parents were outsiders who advocated at the formal meetings without a clear understanding of the resources that could be made available. Like the insiders, they informally tried to influence the thinking and behaviours of teachers, but they did so by building an alliance with them based on volunteering their time and communicating formally and informally (Alper et al., 1995; Grove & Fisher, 1999; Hess, et al. 2006; Stephenson, 1992). They were eager to develop a positive relationship with the school because they believed that the teachers’ cooperation was essential to their children’s academic progress. They participated in a type of social exchange (Grane, Kroeger, & Prager, 2001) in which they volunteered their time and communicated with teachers to obtain information and resources that would support their children. No matter how angry or frustrated they became, the parents understood the importance of maintaining positive relations with the school. These parents were outsiders who tried to develop an alliance with the school; however, unlike the insiders they were not always able to ensure that inflexible teachers provided accommodations or that their children had access to resources or programs.

So important was the school’s cooperation that the participants cautioned against bringing lawyers to meetings because it would be an overly aggressive stance. These parents understood that it was up to the school to provide the accommodations for their children and they did not want to be viewed by the
school as adversarial. For an outsider, being an adversary could jeopardize the relationship with the school and the provision of accommodations and resources.

The data from this study suggest that educational advocacy and banking may be analogous. Credits are gained through communication and volunteering which builds a positive relationship between home and school. However, one dimension of advocacy, arguing the case, could have the effect of debiting the account, especially if the parent came on too forcefully or lawyers were present at the meetings. Participants in this study learned to use the adversarial approach sparingly so as to maintain a credit in the imaginary account and the good will of teachers who would be inclined to provide accommodations for their children.

**Conclusions and Implications**

The mothers in this research were wholly committed to ensuring a positive school experience for their children and they realized that a) their children required academic supports b) there was a relationship between advocacy, positive relations with the school, and resource allocation, and c) unless they advocated for their children, no one else would. For most participants, advocacy was a series of necessary activities that occurred throughout their children’s elementary and secondary schooling. The findings of this research indicated that advocacy activities were organized into four dimensions.

There were two limitations of this research. The first is that there were only 17 participants and they were all from the province of Ontario. However, it is felt that there were sufficient data for readers to transfer the findings to their own situations. The second limitation is the data are restricted to information provided by parents and not educators. Although this study was confined to parents’ perceptions, the inclusion of teachers and administrators in future studies would enrich our understanding of educational advocacy.

An implication for practice is the need for preservice and inservice education for teachers in the area of special education. Parents in this study felt that some teachers were insufficiently informed about specific exceptionalities and how to address dual exceptionalities. Parents seemed to link knowledge with understanding and caring, which motivated a teacher to provide accommodations. However, it should also be noted that a principal’s support of a student’s special needs may be instrumental in obtaining supports, especially in times of scarce resources.

Not all parents are insiders and there will always be limited resources and reluctant teachers, therefore, it would seem important for school boards to make special education policies and procedures transparent to the public. Additionally, parents should learn how to advocate on behalf of their children. An implication is for an expanded role for support groups that should ensure that information about rights and advocacy is available to all parents, particularly when school boards are not transparent and especially for those parents who are new to the system and may not understand their role. Moreover, support groups should develop and promote the service of providing educational advocates for parents who are unable to present the case for their children. Finally, support groups should spearhead advocacy efforts at the district and national/provincial level in order to increase the resources allocated for the needs of students identified with special needs.

Although further work is required to gain a more complete understanding of educational advocacy by parents of students with special needs, our findings contribute to our knowledge of the structure and context of the phenomenon of educational advocacy. Additionally, the findings provide support for the use of the framework of the four dimensions as a tool for analyzing and understanding educational advocacy from the perspective of parents who seek accommodations for their children who are educated in publically-funded schools.

**References**


**Appendix A**

**PARENT ADVOCACY QUESTIONNAIRE: LEARNING DISABILITIES OR GIFTEDNESS**

How old is your adolescent or young adult? ___________________________

What is the sex of your child? (Please circle) Female Male

Who is answering this questionnaire? (Please circle)
Adoptive Mother | Adoptive Father | Birth Mother | Birth Father | Other (identify) __________
A. Diagnosis and Identification of Learning Needs and Strengths

1. How did you first become aware that your child might have a learning disability or have giftedness?
____________________________________________________________________________________
____________________________________________________________________________________
____________________________________________________________________________________

2. Has your child had a psychological assessment? Yes No

3. If yes to #2, what was the diagnosis?
____________________________________________________________________________________

4. If yes to #2, at what age was your child diagnosed? _________________

5. If yes to #2, what led you to seek a diagnosis?
____________________________________________________________________________________

6. If yes to #2, from whom or what organization did you obtain a diagnosis?
____________________________________________________________________________________

7. What characteristics of learning disabilities or giftedness does your child display?
____________________________________________________________________________________
____________________________________________________________________________________
____________________________________________________________________________________

8. What community/health services have you received (if any)?
____________________________________________________________________________________

9. Has your child been identified by the board of education at an Identification, Placement, and Review Committee (IPRC) meeting as having an exceptionality?
Yes No

10. If no, to #9, why has there not been an IPRC?
____________________________________________________________________________________

11. If yes to #9, what exceptionality was identified?
____________________________________________________________________________________

12. If yes to #11, when did the first IPRC occur?
____________________________________________________________________________________

13. Did you have any difficulty convincing the school personnel that your son or daughter had a learning disability or giftedness? Yes No

14. If yes to #13, how did you convince them that your son or daughter had an exceptionality?
____________________________________________________________________________________
15. Does your child have an Individual Education Plan (IEP)?  Yes  No

16. If yes to #15, when was the first one written?  

17. What role did you play in preparing the IEP?  

18. What are your child’s academic strengths?  

19. What are your child’s academic weaknesses?  

20. What other strengths or weaknesses does your child demonstrate (e.g., interpersonal skills, technical skills, artistic abilities, athletic abilities)?  

21. Please write any further comments you would like to make about the diagnosis and IPRC procedures for your son or daughter over the years.  

B. Academic Progress

22. In what type of high school program is/was your son or daughter enrolled?  

23. What accommodations and/or program modifications does your child receive?  

24. How important are the accommodations and/or program modifications to your child’s academic success?  

25. What is the highest grade your child has completed?  

26. If he or she has completed high school, in what year did this occur?  

27. Has your child repeated a grade?  Yes  No  

28. Has your child been accelerated a grade(s)?  Yes  No  

29. If yes to #27 or #28, which grade/s?  

135
30. Has your child been suspended from school?  
   Yes  
   No

31. If yes to #30, how many times?  
   ________________________________

32. If yes for #30, for what reasons?  
   ___________________________________________________________________________

33. Does your child have a transition plan (a plan for transition to employment or postsecondary studies)?  
   Yes  
   No

34. If yes to #33, what plans are proposed?  
   ___________________________________________________________________________

35. Has/did your child discussed dropping out of high school?  
   Yes  
   No

36. If yes to #35, what is the stated reason(s)?  
   ___________________________________________________________________________

37. If yes to #35, what keeps/kept him or her in school?  
   ___________________________________________________________________________

38. Did your child drop out of school?  
   Yes  
   No

39. If yes to #38, has he or she thought of returning?  
   Yes  
   No

40. If yes to #38, what is keeping him or her from returning?  
   ___________________________________________________________________________

41. What career aspirations does your child have?  
   ___________________________________________________________________________

42. Have you discussed possible careers with your son or daughter?  
   Yes  
   No

43. Have you discussed the steps necessary to reach the career goal with your son or daughter (e.g., required education, relevant work or volunteer experience)?  
   Yes  
   No

44. Has your son or daughter received career counselling from the school?  
   Yes  
   No

45. Has your son or daughter received vocational training or participated in co-op, or work experience programs organized by the school?  
   Yes  
   No

46. If yes to #45, describe the training and its usefulness.  
   ___________________________________________________________________________

47. If no to #45, describe what type of training or experience would you have liked for your son or daughter?  
   ___________________________________________________________________________
48. Has your son or daughter taken post-secondary education/training? Yes  No

49. If yes to #48, in what area and at what institution?

50. Was it useful? Why or why not?

51. If your son or daughter is no longer in school, what is he or she doing now?

52. For your child, what would be a successful school experience?

53. Please write any comments you would like to make about the academic progress of your son or daughter over the years.

C. Seeking Information

54. In which of the following areas have you sought information to help you advocate for your son or daughter (please check).

Learning disabilities  Giftedness  Other schools  Other programs offered by the board  Home schooling  IPRC procedures (Parent Guide)  Board policies  Other  (please list)

55. What were your sources of information (e.g., websites, Parent Guide, informal parent sharing, parent support group, etc.)?

56. Do you belong to a parent support group associated with your child’s exceptionality? Yes  No

57. If yes to #56, to which association(s) do you belong?

58. Did you seek information to help you advocate before the first IPRC? Yes  No

59. When do you seek information now (e.g., before each yearly meeting, whenever there is a problem, constantly, etc.)?
60. Please write any further comments you would like to make about seeking information for use when advocating for your child’s needs.

____________________________________________________________________________________

____________________________________________________________________________________

____________________________________________________________________________________

____________________________________________________________________________________

____________________________________________________________________________________

D. Presenting the Case

61. On what occasions do you present the case about your son or daughter’s need to school personnel (e.g., at the yearly review meeting, during the report card interviews, etc.)?

____________________________________________________________________________________

62. Have you ever brought a representative of the parent support group or a lawyer to the meetings?
   Yes  No

63. If yes to #62, why did you invite this person?

____________________________________________________________________________________

____________________________________________________________________________________

64. Did this person help you achieve the outcomes you desired for your child?
   Yes  No

65. If no to #62, why have you not invited a representative of the parent support group or a lawyer to the meetings?

____________________________________________________________________________________

66. Do you meet with the teachers at times other than the IPRC review meeting to discuss your son’s or daughter’s accommodations or program modifications as they are written in the IEP?
   Yes  No

67. If yes to #66, how often?

____________________________________________________________________________________

68. Do you try to educate the teachers about learning disabilities or giftedness?
   Yes  No

69. If yes to #68, how do you do this (e.g., providing lists of websites, pamphlets, etc.)?

____________________________________________________________________________________

____________________________________________________________________________________

70. Have you lobbied politicians about the needs of students who have learning disabilities or who are gifted?
   Yes  No

71. If yes to #70, state who the politicians were (e.g., trustees, MLA) and describe the actions you took.

____________________________________________________________________________________

____________________________________________________________________________________

72. What have you learned about presenting the case for your son or daughter to school personnel?
73. Please write any further comments you would like to make about presenting the case to school personnel.

____________________________________________________________________________________

____________________________________________________________________________________

E. Monitoring

74. Do you monitor how your son or daughter is performing academically in school?

   Yes  No

75. Do you monitor how your son or daughter is feeling about school?

   Yes  No

76. Do you monitor if the accommodations and/or program modifications are being implemented?

   Yes  No

77. If yes to # 74, 75, or 76, how often do you monitor the above?

____________________________________________________________________________________

78. Do you monitor other aspects of the school program in which your son or daughter is involved?

   Yes  No

79. If yes to #78, what are these aspects?

____________________________________________________________________________________

____________________________________________________________________________________

80. Why do you engage in the monitoring discussed in the previous questions?

____________________________________________________________________________________

____________________________________________________________________________________

81. Please write any further comments you would like to make about monitoring.

____________________________________________________________________________________

____________________________________________________________________________________

____________________________________________________________________________________

F. Other

82. Do you provide assistance to your child to complete homework or assignments/projects?

   Yes  No

83. If yes to #82, under what conditions and how frequently do you provide help (e.g., most nights, only when asked)

____________________________________________________________________________________
84. Does your son or daughter have a tutor?
   Yes      No

85. If yes to #84, for which subjects is he or she receiving tutoring?
   ____________________________________________________________

86. Have you talked to your son or daughter about how to self-advocate?
   Yes      No

87. List the 3 aspirations you have for your child.
   ____________________________________________________________
   ____________________________________________________________

88. List the 3 most important concerns you have about your child and his or her future.
   ____________________________________________________________
   ____________________________________________________________

89. What has been most helpful to you as a parent of a child with learning disabilities or giftedness?
   ____________________________________________________________
   ____________________________________________________________

90. What are the factors that have contributed to your son’s or daughter’s success?
   ____________________________________________________________
   ____________________________________________________________

91. What are the factors that have hindered your son’s or daughter’s success?
   ____________________________________________________________
   ____________________________________________________________

92. What advice do you have for parents of children with learning disabilities or giftedness?
   ____________________________________________________________
   ____________________________________________________________
   ____________________________________________________________
   ____________________________________________________________

93. Please write other comments about your child with learning disabilities or giftedness and your experiences raising him or her.
   ____________________________________________________________
   ____________________________________________________________
Thank you for your time and the information you have provided. Please mail this questionnaire within one week of receiving it using the envelope that is provided.

If you would like to participate in an interview to discuss your experiences as an advocate for your child’s needs, please complete the section below.

Name: ___________________________________________________________
Evening Telephone Number: ________________________________________
Daytime Telephone Number: ________________________________________
E-mail Address: ____________________________________________________

Appendix B

Parent Advocacy Interview

1. Tell me about the process in which your son/daughter was assessed by a psychologist.
2. How did you feel about the diagnosis?
3. What did you know about learning disabilities/giftedness before the assessment?
4. Tell me about your first experience with an Identification, Placement, and Review Committee (IPRC)?
5. Did you participate in developing the IEP? If so, how did you assist?
6. Were you satisfied with the level of participation and the experience in general?
7. What accommodations or program modifications does/do your son or daughter require?
8. Were they written in the psychological report? Did you have to fight to have them included in the IEP?
9. How is your son/daughter progressing in school?
10. What would be the ideal program for your son or daughter?
11. How do you seek information when advocating? (e.g., Internet, support group)
12. When do you seek information, for example before the annual IPRC review meeting?
13. Do you attend the IPRC review meeting? How do you prepare for it?
14. Do you meet with teachers at times other than the IPRC review meeting? What is the purpose of these meetings? How do you prepare for them?
15. Have you lobbied politicians? If so, for what? Describe your experiences. (With the support group? How did you prepare? What happened when lobbying? Were you successful?)
16. Do you monitor your son/daughter’s progress in school? How do you do this?
17. What do you do if your son/daughter’s progress is not what is expected or your child is frustrated?
18. What things have hindered your progress when advocating for your son/daughter’s educational needs?
19. What things have facilitated your progress when advocating for your son/daughter’s educational needs?
20. What suggestions do you have for parents who advocate?
21. Please make any other comments you would like about your experiences advocating.
LIFE SKILLS TRAINING THROUGH SITUATED LEARNING EXPERIENCES: AN ALTERNATIVE INSTRUCTIONAL MODEL

Shelly Meyers
Richard Stockton College of New Jersey

This article examines the value of situated learning as an alternative to the traditional college course instructional approach for pre-service teachers. The situated learning mode of teaching immerses students in the actual setting, practicing the skills and concepts emphasized in the curriculum. Through a partnership with a college, community agency and public school, graduate students in the special education program developed and implemented a life skills curriculum for individuals with developmental disabilities, while learning essential principles of delivering instruction. The school aged students who participated in the study were from an urban, racially mixed public school district and they attended the program at the end of their regular school day. Analysis of data from student surveys and focus groups revealed the effectiveness of the situated learning model.

Background

Federal legislation, No Child Left Behind (2001) and the Individuals with Disabilities Improvement Act (2004) emphasize inclusion of students with disabilities in general education settings, while also mandating their participation in state assessments and attainment of proficiency in the areas of literacy, mathematics, and science. As a result, students with disabilities spend most of the school day preparing for tests, rather than learning skills they need after leaving school. These fundamental life skills take a back seat to a total academic program, which discounts the need for skills in preparation for the transition from school to the community.

Special educators, school administrators, and parents recognized the lack of life skills instruction in our public school programs as well as neglecting life skills methods courses in teacher preparation programs. This group of concerned stakeholders believed it was time to address this ongoing dilemma and initiated a discussion with special education faculty at a local college. The faculty shared the concerns that reached even further into the ways in which colleges were preparing pre-service teachers to meet the needs of the diverse populations in their classrooms. As a response, they developed a survey to determine the extent of life skills programs for students with disabilities in the nearby school districts. The survey asked the following questions:

1. Which areas of life skills instruction does your district provide for students with I. E. P’s?
2. Does the life skills instruction provided by the district prepare students with disabilities for post school community inclusion?
3. How would you rate the extent of life skills instruction provided by your district?
4. Do classroom teachers have the knowledge and skills required to teach life skills as part of the school day?

The survey was completed by graduate students pursuing degrees in special education. Results of the survey indicated that there were social skills and counseling programs available for students with disabilities but life skills were not being addressed. They reported that even if there was time during the school day to teach life skills, they were not prepared to do so. Teachers in self-contained settings implemented life skills on a limited basis, but all teachers indicated that they focused most of their academic teaching time on preparing for tests. Teachers in the county special education schools noted
that life skills training began at the middle school level and continued until graduation with community based training incorporated in the program.

The Life Skills Training Initiative grew from the survey results and input from public school teachers, parents, administrators and college faculty. The important issues that the initiative addressed were (a) how teacher preparation programs ensure that pre-service teachers have the knowledge, pedagogy and experiences to teach life skills in the inclusive classroom, (b) how general education teachers, who have students with disabilities in their classrooms, make certain they acquired the necessary skills to transition into adulthood, and (c) how teachers can facilitate the mastery of life skills that fosters the students’ independence and self-determination so that their opportunities for inclusion in the community are maximized. At the end of each semester, graduate students completed a final survey, where they were asked to evaluate the effectiveness of the situated learning experience.

First Steps
College special education faculty approached a local school administrator with a proposal whereby they would provide teachers in the district with strategies to teach life skills. The response from the administrator was positive but the question of time was an issue. Using time after school was suggested but there were no funds to pay teachers to extend their school day. The college faculty thought of alternatives and considered teaching a special education graduate course at a site off campus held after school hours that included teaching life skills to students with disabilities as part of the course objectives. Next, the Arc, a non-profit organization for individuals with developmental disabilities, was contacted and agreed to allow the faculty to use the facility for the Life Skills Initiative. In addition, the Arc personnel enlisted their adult clients who have developmental disabilities to attend the program. The public school administrator arranged transportation for the students to travel to and from the Arc and Arc clients used transportation provided by their case managers or the county access system. The plan was ready to start.

Program Design
Situated learning is the model of instruction for the Life Skills Initiative and yet, it is not widely used for college teaching. Typically, higher education programs base instructional delivery on lectures, discussion and demonstration. More recently, however, adult education programs, especially in teacher preparation, designed courses where students engaged in collaboration with peers, reflection and had opportunities to learn through authentic and student-centered activities. The graduate special education students learned the application of specific teaching strategies with school aged and adult students with disabilities as they designed and implemented life skills curricular units. Situated learning brings the students to the experience and through activities; they participate in the teaching and learning process (Utley, 2006).

The graduate students worked in small groups or teams as they created life skills units complete with unit goals and standards of mastery, pre and post assessment tools, formative assessments that monitored students’ progress, and activity based weekly lessons for the delivery of content. The members of each group analyzed the young and adult students’ performance and together planned activities based on their levels of skill attainment as well as identified areas for instructional improvement (Gardiner, Corbitt & Adams, 2010). The adults came to the program with individual person centered plans that included goals. The graduate worked with the adults on their specific goals and designed appropriate lessons. Throughout the experience, graduate students took responsibility for their own learning as they connected to the entire teaching and learning process (Donham, Heinrich & Bostwick, 2010). They engaged in group and individual reflective activities after each class session to identify the strengths and weaknesses of past lessons as they worked together to improve future lessons.

Literature Review
Introduction
A review of literature substantiated the effectiveness of life skills training through a situated learning model of instruction. Life skills are necessary components of any educational program for all students; with or without disabilities. As teachers ready their students with 21st century skills, life and career education is mandated in most states. As early as preschool, teachers are introducing skills in the social and emotional domains as foundations for future life and career skills.

Situated learning is on the job training with invaluable benefits for students in teacher preparation programs. Students who have opportunities for hands-on practice before they become full time teachers allow them to develop their skills and integrate them into their own repertoire of knowledge. In addition,
this model of instruction emphasizes 21st century skills such as collaboration, teamwork and leadership, reflection and critical thinking and authentic application of concepts.

Also highlighted in literature are the instructional styles of teachers who implement situated learning most effectively. They are characterized as facilitators of knowledge rather than teaching knowledge directly. Teachers relinquish the more dominant role in the classroom and opt for a more collaborative approach to teaching and learning.

Life Skills
Life skills units developed by the graduate students include functional academics (e.g. reading, math, writing, and problem solving); community living skills (e.g. money management, community access, and safety); personal and social skills (e.g. nutrition, hygiene, civic responsibility, and communication); vocational skills (e.g. career awareness and job search); and self-determination, goal setting and self-advocacy (Benz & Lindstrom, 2003). As the graduate students worked with the school age and adult students, they recognized that their contribution to the acquisition of life skills was critical and that when compared to their own students without disabilities, these students were lower in skill ability for post school transition (Lindstrom, Paskey, Dickinson, Doren, Zane, & Johnson, 2007).

Using an authentic site like the Arc was conducive for movement and hands-on activities. It provided a real-life setting where teachers guided students in learning skills they could then transfer to their natural environments (Wolfe, Van Ejck, Marshall, & Mazumder 2009). The Arc had a kitchen, computer labs and several activity rooms that resembled real contexts where the skills would eventually be applied (Herrington, Reeves & Oliver, 2006; Mastro, Jalloh, & Watson, 2006).

Situated Learning
Collaboration, Teamwork and Leadership
Collaborative efforts in situated learning are central components because of the team planning sessions where group members define their roles and bring their own subject area expertise to the interdisciplinary life skills curriculum. The students interacted with members of their teams or learning communities, which were peer directed rather than the typical teacher to student relationship found in traditional classrooms (Lunce, 2006). The groups had opportunities to look at the curriculum and at the planned activities through different perspectives and expertise, considering each member of the team a resource to further their own learning (Utley, 2006). Team members assumed leadership roles in instructional development at times when their specific expertise was required.

Through collaboration, they applied their expert knowledge to enhance and enrich the life skills initiative and by working together to refine the assignments, they included specific strategies to meet the needs of the individual learners (Herrington, et al. 2006). The graduate students refocused their individual goals to the goals and accomplishments of the group. They participated in shared decision making and learned response strategies from each other that helped them solve unexpected problems and situations. They brought their prior knowledge and newly acquired knowledge to the social community they created through their collaborative efforts (Miraglia & Smilan 2009; Knotts, et al 2009).

Reflection and Critical Thinking
Utley (2006) identified reflection and critical thinking as other essential elements in the situated learning model of instruction. The graduate students spent time during each class session reflecting on the activities and students’ learning through formative assessment results. When the school age and adult students left for the day, the graduate students met in their groups and reflected on the days’ events while planning the following lessons. They met in their separate teams first, sharing observations and anecdotal summaries of the students’ performance from the lessons they implemented and afterwards, the teams shared with other teams, as they reflected on their own learning and how they would transfer and apply the new knowledge to the contexts in which they themselves taught (Trigwell & Ashwin, 2006). They self-assessed their progress while reflecting with their teammates on the effectiveness, strengths and weaknesses of the activities and lessons they delivered to the young and adult students. Reflecting with their peers, exchanging thoughts about curriculum development, problems encountered and sharing ideas about solutions to those problems, enable them to realize that their learning and the students’ learning was meaningful and appropriate for use in their own classrooms (Miraglia & Smilan, 2009: Longfellow, May, Burke, & Marks-Marlan, 2008.; Canipe & Decker, 2004). Knotts, et al (2009) discussed the importance of teachers’ own reflection in their practice because most
are entrenched in their specific subject areas and when observing and interacting with teachers in other disciplines, they are able to make connections and adopt different practices that may improve their delivery of instruction.

**Authentic and Student-Centered Activities**

The graduate students designed and implemented lessons that were multi-modality, presented in authentic and challenging ways and were appropriate for the interest and ability levels of the students (Knotts, et al 2009, Miraglia & Smilen 2009). The after school format for instruction proved positive for the students’ learning experiences because it enabled them to extend their social interactions with peers from school and their employment settings in a familiar community. Longfellow (2008) reported that after school/after work programs are effective to meet the needs of students when life skills are taught in real life settings and where students work alongside others with whom they feel a kinship and comfort level for risk taking and problem solving. The graduate students administered pre tests for each life skills unit and based on the students’ performance, constructed lessons that filled in gaps or remediated areas of weakness. The lessons were student centered and presented in a meaningful context whereby the young and adult students understood the relevance of the learning goals (Hannafin, 2009). Rather than a more linear approach to teaching new concepts we find in traditional classrooms, the graduate students taught the life skills in natural contexts and the young and adult students applied their new learning to their own natural environments (Lunce, 2006; Wolfe, et al 2009).

As the graduate students became more familiar with authentic activity development, they chose to focus the lessons on real life tasks that required the young students to spend more time working to complete their projects while receiving feedback from the graduate students which promoted their motivation, sense of accomplishment, pride, and ownership for a job well done (Herrington, et al 2006; Trigwell & Ashwin, 2006). The authentic activities had assessment tools built in, both formative and summative, which were criterion-referenced based on the content of the unit. These assessments allowed for the ongoing monitoring of student progress which then provided information for the future design of instructional plans (Herrington, et al 2006).

**Faculty Instructional Styles**

Implementing a situated learning model of instruction differs greatly from the traditional classroom genre and therefore requires faculty to adopt different teaching strategies and methods of content presentation. In fact, the instructor does less teaching and more facilitating, encouraging, and monitoring of student progress. The graduate special education faculty realized that their teaching styles needed adjusting. Rather than givers of information, faculty encouraged peer collaboration, risk taking, problem solving, and decision making. Faculty emphasized the importance of self reflection and reflective activities with each other to increase their confidence in relying on their own instincts and perceptions (Miraglia & Smiljan, 2009). Faculty was still responsible for all students’ learning and accomplishing the course goals. For a period of time during each class session, faculty presented material, answered questions, engaged in dialogue, and provided feedback to students to ensure their acquisition of course content (Struyven, Dochy, & Janssens, 2008).

**Life Skills Lessons**

**Financial Sense: Consumer Education**

The first step to unit planning was the development of a scope and sequence in each content area. The graduate students investigated the life skills topics and determined which concepts they would include in their theme. The next step was the informal pre-assessment tool, which they utilized to determine the prior knowledge of the students before beginning the instruction. For the consumer education unit, the graduate students used an inventory of coins and dollars of different denominations, functional vocabulary that included survival words, and addition of money with decimals. After analyzing the test results, they created lessons to target the skills not mastered by the students.

An introductory lesson reinforced the initial concept of coins and their values and was delivered in a game format. Students had cards with coins printed on them and calculated the value of their coins to see who had the most money. The graduate students assessed through observation and a checklist to guarantee that the students had enough knowledge of coins and their values before moving to the next activity, which focused on the concept of comparative shopping. Using circulars from local newspapers and given a budget to work from, the students shopped. With teacher assistance, they analyzed the prices listed in the circulars to determine which products would provide the most value for the cost. They used
play money to pay for the products and calculated change as well. The post assessment consisted of students purchasing real items in a store setting, created by the graduate students, to simulate an authentic shopping experience. The students were given play money, again, and did real shopping. The graduate students assisted them in estimating the cost of purchase to ensure they had enough funds to shop. They were also encouraged to make wise choices; buy foods that were nutritious, and supplies that they needed most. During all of the activities, the graduate students worked either one on one or a one to three ratio with the young students, continually increasing the complexity of tasks and using visual cues and concrete materials as students practiced their problem solving skills.

Community Safety
The graduate students found many components included in a community safety unit and narrowed it to safety situations such as fire in the home and general home safety, school safety, stranger awareness and reading functional signs to help them navigate their community. Much of the pre-assessment focused on real life scenarios and visual aids that facilitated discussion along with student interviews. The pre-assessment results assisted the graduate students in further narrowing the theme because the young students had a good deal of prior knowledge in the areas of safety in school and functional signs, however they lacked application of skills in stranger awareness, home, and fire safety.

At the beginning, the students were required to identify basic safety precautions and through discussion, students reasoned why they were essential. One graduate student worked with one or two younger students in completing this task, after which the young students illustrated their own booklets that included written safety rules that they wrote with the help of the graduate students. A next activity focused on role playing, whereby each student was given a scenario to act out along with the safety rule associated with it. A post assessment included an informal interview checklist, which the graduate students administered individually to the young students.

Behavior at Home, in School and in the Community
The behavior unit was different from the others because rules in school are school specific so the graduate students interviewed the young students to identify their own school rules. From the information they received as well as the rules they themselves use in their own classrooms, the graduate students developed the scope and sequence for the following: school rules and reasons for complying with them, strategies for anger management, developing self-esteem, self-determination, and goal setting based on their own values. The graduate students administered a pre-assessment that relied on the interview and checklist format that determined background knowledge.

A first activity required the young students to identify the possessions they deemed most valuable. The graduate students provided a scenario about a fire and asked the students to identify what in their homes they would save first and why. As the young students discussed their priorities, the graduate students questioned their reasoning and asked them to explain their rationale for the decisions they made. The graduate students gained insight through the responses that enabled them to design further activities that were more relevant to the students’ frame of reference and background. Other activities included in the behavior unit were strategies for anger management, following school rules, and setting goals, which were implemented through role playing. And finally, the young students designed a picture frame to illustrate symbols that represented the statement; I believe in me that included people and possessions they believed identified their individuality. The post assessment was an interview and checklist.

Social Language
The graduate students incorporated language instruction into each life skills unit. Simple exercises such as greeting another person, asking for help in a given situation, vocabulary and phrases needed for shopping, cooking, or responding to different social situations were part of every lesson. The graduate students learned that they needed to adjust their expectations and create activities that were more reflective of the students’ frames of reference as they paid attention to the responses and reactions of the students in the varied activities (Akiba & Aikins, 2010). Adding the language component also enhanced further the concept of an interdisciplinary approach to instruction.

Benefits for School Aged Students
The young students that attended the program benefited from the small group and individualized instruction in a student-centered environment that simulated authentic situations based on the pre and post assessment results. The students participated in experiences where they interacted with the learning
environment while receiving regular feedback on their accomplishments (Hannafin, et al 2009; Knotts, et al 2009; Calderon, 2009). The practice of facilitating learning in a more realistic setting helped students make meaning of the concepts as they integrated them into their ecological environments (DalBello, Knowlton, & Chaffin, 2007). In addition, working in small groups removed the competition and allowed students the opportunities share with their peers while having the freedom of independently working toward their own goals (Lunce, 2006). Herrington (2006) summarized additional benefits for learning in an alternative setting away from the classroom and reported that being away from the school removes many constraints and provides meaningful contexts for the learning. A major advantage of the unit design and delivery is the interdisciplinary nature of the activities. Although each activity had primary goals and objectives, there were secondary objectives integrated throughout. When students learned about money, they added, subtracted, estimated, and used relevant math vocabulary. Many times, the students were required to problem solve, apply skills to real life situations, and communicate with appropriate language given specific scenarios. In addition, they had opportunities for practice and repetition of concepts which aided in their memory skills.

Social language was emphasized and continually reinforced by the graduate students. The young students received modifications in instructional strategies to meet their needs as graduate students rephrased instructions, presented visual and auditory cues, graphic organizers that helped with organization, and simplified tasks using task analysis and scaffolding. Modifications were made to accommodate cultural and language differences, as well.

Method and Results
To explore how students responded to this alternative instructional model, a pilot study was run. Twenty-nine students in traditional courses and 55 students in courses at the Arc were asked to evaluate their experience using a specially-designed evaluation form. The students were mainly women (83%) and their mean age was 33.4 years (standard deviation = 9.2)

The two groups of students were compared for their total overall score and for their scores for each item. Overall, the students in the Arc course gave a higher rating for the course than the students in the traditional course. The mean total scores on the 21-item questionnaire were 111.7 and 103.5, respectively, which is equivalent to mean score per item of 5.32 and 4.93 on a 6-point scale. This indicates that students in both types of class found the course experience to be positive and useful, but the students in the Arc classes rated their course higher.

The students were selective in their higher ratings for the Arc course in several items on the rating scale. They indicated that the situated learning model facilitated their skills in working as a team member, helped sharpen their problem solving skills, provided opportunities to practice multiple skills and explore different models and approaches for instructional decision making.

There were no differences on items in the rating scale between students in the Arc program and the traditional students. Both groups reported that they sharpened their analytic skills, felt confident in tackling unfamiliar situations, understood the learning process, explored their academic interests with faculty and other students and felt part of a group that was committed to learning.

Focus Group Responses
The graduate students participated in focus groups at the end of their participation in the program, which provided information about the effect that situated learning had on their own learning. The focus group questions were designed to bring forth information and insight from the participants that then led to unexpected discussion topics since no definitive agenda was established (Williams, Graham, McCary-Henderson & Floyd, 2009). The college faculty looked for evidence from the graduate students of their own intrinsic growth and their ability to influence the educational environment. As they observed the young students first hand, the graduate students realized the attainment of their own goals through independent efforts as well as collaborative partnerships with their colleagues (Wood & Oliver, 2008).

Focus group facilitators began by asking the graduate students to reflect on the hands-on learning experiences. Discussion proceeded to identifying the purposes of the hands-on instructional model and the types of learning that occurred. In response, the graduate students believed that the situated learning experience enabled them to apply theory to practice. They were able to modify instruction on the spot
when approaches to instructional delivery were ineffective. The young students’ growth was evident, based on observations and pre and post test data and an added benefit was that both the young students and graduate students learned from each other in the process.

Collaboration and reflection were main components of the situated learning model and were included in the focus group discussions. The graduate students indicated that they enjoyed opportunities to exchange ideas among themselves as well as between groups in a comfortable, more relaxed setting, where they found common ground for interaction, sharing and problem solving. They responded through focus group discussions that their confidence increased by working with colleagues as they practiced multiple skills such as co-teaching and planning, and also engaged in dialogue with the college faculty about the course content.

When asked what improvements could be made to further enhance the effectiveness of the course, graduate students replied that there was a need for more specific course objectives and standards for their performance as they completed the course requirements. They were unsure of particular curriculum development and testing procedures for the life skills initiative and requested explicit guidelines from the special education faculty. The school district would not share information about the young students’ disabilities because of confidentiality issues, and the graduate students believed this hindered their abilities to meet their individual academic and social and emotional needs. The college faculty made improvements to the program, which included a more detailed description of the course objectives and performance standards as well as a brief overview of curriculum development and assessment strategies.

Discussion

When the college faculty joined in the partnership with a community agency for individuals with disabilities and a public school, they looked to improve their teacher preparation program. Faculty in teacher preparation programs want to make sure that pre-service teachers are able to teach life skills as well as all content area curricula to the diverse student population in today’s classrooms. The life skills initiative proved to be an effective approach when exposing graduate students to authentic learning, developing interpersonal communication skills, and collaborating and reflecting on their own learning. The situated learning model of instruction satisfies college faculty’s efforts in making certain that their students acquired the skills, knowledge, and pedagogy to teach in the inclusive classrooms they would soon encounter as fully certified special education teachers.

More and more teacher preparation courses are embracing the situated learning model as an alternative to the traditional college classroom. The model itself is straightforward and easily incorporated into content-area methods courses, providing opportunities for students to learn the concepts in realistic settings. The more teacher preparation programs provide opportunities for their students to engage in the teaching-learning process by emersion in the situated learning model of instruction, the greater the possibility new teachers will take the new knowledge and integrate it into their own classrooms. The partnership between a community organization, college, and public school district also resulted in benefits for the young student participants. Throughout the process, they learned life skills that would in the future contribute to their successful transition into the community (Lindstrom, et al 2007).

References


MAKING SENSE OF MINORITY STUDENT IDENTIFICATION IN SPECIAL EDUCATION:  
SCHOOL CONTEXT MATTERS

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Since the inception of special education, researchers have identified higher proportions of minority students with disabilities than expected. Yet, relatively few studies have considered the contributions of the school context on a large scale to the identification of students with mental retardation (MR), emotional disturbance (ED), and learning disabilities (LD). The present study examined the extent to which race and gender of 1,394,024 students, alone and nested within 2,104 schools, predicted identification in the special education categories of MR, ED, and LD. Results revealed that, alone, student race and gender significantly predicted identification in all three categories. However, when student race and gender were nested within school context variables, they were not significant predictors; school variables alone predicted identification. School variables that were significant included school attendance rate, for all three special education categories. For MR, school mobility rate, teacher education, adequate yearly progress, and size and locale of the district were also significant predictors. The proportion of students from low income families and average teacher salaries were significant predictors for ED, and district size, as well as ratio of pupils to certified staff were significant predictors for LD. Results are discussed in the context of previous work in the field.

Bronfenbrenner’s (1977; 1979; 1992) theory of nested ecological systems and their importance for human development provides an ideal framework for understanding the successful development of children and adolescents in multiple social contexts. The framework permits us to study continuity and change in children’s development (i.e., physical, cognitive, social, emotional) in the places where they live and learn, rather than in isolation. Implicit assumptions about context in Bronfenbrenner’s theory include interactions and relationships among the person, the process, and the context itself (places and groups for development), all happening over time and within spaces. We employed Bronfenbrenner’s theory in pursuit of understanding the complex influence(s) of the larger school context on minority student identification in special education. To do that, we cast a wide net to examine student and teacher demographics, characteristics of families from the perspective of the schools, national school policies and local funding levels, the structure and locale of the school, and community variables such as district size and community poverty.

This study is important because, although most of the above school factors have been considered previously in the study of minority students in special education, these factors have not been explicitly linked to the particular schools that minority students attend. That is, previous research using large sample sizes has focused on the *social address* characteristics of individuals: race, gender, and social class (Bronfenbrenner, 1992), alongside descriptive school and community variables, rather than as nested variables: students within schools. These studies find that one’s social address is all important for special education identification (Artiles, Rueda, Salazar, & Higareda, 2005; Coutinho & Oswald, 1998;
Bronfenbrenner provided us with the framework to do this; by allowing us to examine the immediate settings containing the developing person, as well as the larger social contexts, both formal and informal, in which these settings are embedded (Bronfenbrenner, 1977, p. 513). Immediate settings for children include the home, school, peer group, and neighborhood (microsystem), whereas larger social contexts include interactions among these settings (mesosystem), as well as the effects of systems that impinge on the life of the child, such as government policies and how they play out (exosystem). Broadest of all influences are those that include the economic, social, educational, legal, and political (macrosystem).

Research across developmental periods in special education has revealed the importance of contexts beyond the individual child to his or her development, including the development of a disability. Social contexts for development include families, peers, schools, cultures, and communities (Artiles, 2003; Artiles & Bal, 2008; Barth, Dunlap, Dane, Lochman, & Wells, 2004; Estell, Jones, Pearl, Van Acker, Farmer, & Rodkin, 2008; Fleming, Cook, & Stone, 2002; Kellam, Ling, Mersica, Brown, & Ialongo, 1998; Pianta & Walsh, 1996; Talbott & Fleming, 2003; Wang, Haertal, & Walberg, 1990). Researchers have acknowledged that the processes resulting in disproportionate identification of minority students in special education are complex, interactive, and perhaps contradictory (Skiba, Simmons, Ritter, Kohler, Henderson, & Wu, 2006, p. 1452); that the placement of minority students in special education is far more complex than a disability prevalence quandary (Artiles & Bal, 2008, p. 6). Such complexity argues strongly for research that seeks to understand identification from the perspective of a nested ecological model, to understanding contexts beyond the individual child and family, especially as exploration of the layers considered by Bronfenbrenner can contribute to intervention.

Variables associated with the school context are particularly critical for understanding school experiences of minority students, given the likelihood that they attend schools that are less well-funded and more segregated than those of their Caucasian peers (Artiles, 2003; Darling-Hammond, 2006). School-based risks disproportionally experienced by minority children and youth extend to special education. Over time, minority children and youth are more likely to be exposed to lower quality teachers, materials, and curricula (Darling-Hammond, 2006), which can certainly affect the development of a soft disability (such as MR, ED, and LD). Thus, although minority children and youth enter schools with a range of experiences associated with the rich sociohistorical context(s) of home and family (Artiles, 2003; Artiles & Bal, 2008), their families are often blamed for the emergence of disabilities, with the quality of instruction rarely considered (Harry & Klinger, 2006). Such a view completely ignores the responsibility of schools in educating children over the course of time.

Historically, disabilities have been seen to reside largely within the child, with a focus on personal, individual attributes and family characteristics (Harry & Klinger, 2006). Yet this view is simplistic, ignoring the intersection between students’ culture and school culture, as well as systems of educational support (or lack thereof) experienced by an increasingly diverse population of youth (Artiles & Bal, 2008). Although a significant body of work has sought to address the issue, the full complexity of minority students’ disproportionate representation in special education is still not fully understood (Artiles & Bal, 2008; Skiba, Simmons, Ritter, Gibb, Rausch, Cuadrado, & Chung, 2008). In the present study, we expand upon previous research in minority students’ representation in special education by (a) application of Bronfenbrenner’s nested ecological model and (b) use of hierarchical linear modeling (HLM) techniques to test the model, with a particular focus on students nested within schools, which are then described by a wide range of previously tested variables.

Our ability in the present study to locate students within their schools, as we simultaneously examine the effects of individual (race and gender) as well as school and district level characteristics in the context of
Bronfenbrenner’s model, contributes an additional layer of complexity to the study of disproportionality in special education. We begin here with a review of key variables at each level of Bronfenbrenner’s nested system.

Microsystem

First, at the level of the microsystem, are race and gender. Across multiple chapters in the Losen and Orfield (2002) volume on racial inequity in special education, and in studies using multiple indicators of risk for identification in special education (i.e., Artiles et al., 2005), as well as research using large samples at the national and state levels, race and gender have emerged as powerful predictors, typically seen as operating at the level of the individual, or microsystem (Coutinho & Oswald, 1998; Coutinho & Oswald, 2005; Coutinho et al., 2002; Oswald et al., 2002; Oswald et al., 2001; Oswald et al., 1999; Skiba et al., 2005).

Indeed, in a statewide study examining the effects of race and poverty at the school district levels, Skiba and colleagues found that race was the all-important variable, trumping poverty in predicting special education status (Skiba et al., 2005). At all economic levels, African-American males were overrepresented in the special education categories of MR and ED (Skiba et al., 2005). Our study builds upon Skiba and colleagues’ research by including many of the same types of measures in the model (i.e., race of students in the school, percentages of students receiving free or reduced lunch, teacher salaries, per pupil expenditures, and measures of achievement); we expand upon this research by looking at individual students’ race nested within the schools they attend, and including these very same measures within the model.

Indeed, we view race and gender effects as very much operating within the schools, beginning at the mesosystem level. Many African American and Latino children, particularly those students living in lower-income urban communities, attend racially segregated schools. Approximately 45% of children who live in cities attend schools where more than 75% of children are African American or Latino (U.S. Department of Education, 2008). These children have historically lacked access to excellent educational opportunities and continue to be among the least well-served by American schools. The National Research Council, NRC (Donovan & Cross, 2002) employed a nested ecological model along the lines of Bronfenbrenner’s to explicite the contextual influences on minority student representation in special education. In this model, the NRC authors focused solely on the individual and school contexts, examining policy influences at the school level. The NRC clearly indicated that risks associated with growing up in poverty were exacerbated by experiences with poor schooling. In fact, the NRC report concluded that the school experience itself contributes to racial disproportion in academic outcomes...that lead to placement in special education (p. 358).

Also reviewed by the NRC, and at the heart of the social context at the level of the microsystem, are relationships and interactions between teachers and students (Hamre & Pianta, 2001; Harry & Klinger, 2006). Such relationships, beginning in the early grades, can have lasting influences (both positive and negative) on student outcomes, including special education identification, and may or may not be influenced by student age, race, and teacher-student race match (Saft & Pianta, 2001; Harry & Klinger, 2006). For example, Saft and Pianta (2001) found that child age and race and teacher-child race match were consistently related to teachers’ perceptions of children, so that when teachers and students shared the same race, teachers rated their relationships with children more positively. Our study included a measure of teacher-student race match, albeit at the level of the mesosystem. Teachers’ race in our study was only available at the district level, whereas student race was measured at the school level. Although this was a less-than-sensitive measure of the match we were seeking, we found this to be an opportunity to obtain a measure of district-level policy regarding teacher and student race, which could affect minority students’ special education status. Our study thus builds upon previous research in using this measure of district level policy regarding race, a first in the large sample studies of disproportionality.

At the heart of the microsystem is teacher quality: regarding both effective classroom management strategies and quality academic instruction. Harry and Klinger (2006) found that quality of teaching played a role in students’ identification in special education (Harry & Klinger, 2006). Quality of classroom management is a powerful and lasting characteristic that can significantly affect the behavior of the most aggressive students over the course of five years of schooling (Kellam et al., 1998). We were not able to examine student-teacher relationships or quality of teacher instruction and classroom management in the present study; yet they may be indirectly influenced by factors we do measure, such
as teacher education levels and resources available to the schools, which affects schools’ abilities to recruit and retain the best teachers (Darling-Hammond, 2006).

**Mesosystem**
The classroom setting has its own contextual influences at the level of the mesosystem (relationships among family, school, and peers). Ethnic makeup of the school (particularly when large portions of students are from minority backgrounds) is inextricably correlated with student outcomes (Blanchett, 2006; Darling-Hammond, 2006). Whereas predominately African American schools do not contribute disproportionate numbers of African American students to special education at the school level, they do contribute to disproportionality overall, and reflect the disparate quality of education experienced by students of color in American schools (Blanchett, 2006; Harry & Klinger, 2006). The present study contributes to previous research by assessing the contribution of the racial composition of schools to special education identification, again a first in large sample studies of disproportionality.

Families’ involvement in their children’s education is clearly a necessary component to student success (Fantuzzo, McWayne, Perry, & Childs, 2004; Pianta & Walsh, 1996). The family context is rich, diverse in structure, and often supportive of children in ways that are hidden to the school. Yet, parents of minority children can be harshly stereotyped by school professionals, blamed for their children’s difficulties in school, and disenfranchised by the school (Harry & Klinger, 2006). Ironically, the school context can be a source of risk rather than resilience for minority children and their families. Our selection of parent and family variables at the mesosystem level reflects connections between families and schools at a broad level, and from the perspective of the schools: parent involvement, student attendance and mobility, student truancy, and family income (Epstein & Sheldon, 2002; Heinlein & Shinn, 2000). As such, we widen the lens beyond the close and careful look taken by Harry and colleagues at families as sources of resilience and strength for children with regard to their special education experience (Harry & Klinger, 2006). Our study advances the literature by selecting variables that schools can address, on a large scale, to improve the overall achievement of minority students, specifically by building and maintaining relationships with families (Epstein & Sheldon, 2002). School professionals agree that student attendance and mobility are significant factors in children’s success in school, and in their ability to serve children (Skiba et al., 2006). We see these factors as part of the schools’ responsibility, rather than solely that of families.

**Exosystem**
At the exosystem level, teachers and children are influenced by policy decisions that impinge upon children’s achievement, particularly high-stakes testing associated with the standards-based reform movement in education (Heubert, 2002). Although minority students and students with disabilities have the potential to gain from policies driven by high-stakes testing, they are also most likely to suffer without access to a rigorous, high quality education (Heubert, 2002). Our study expands upon previous research by ascertaining the extent to which those No Child Left Behind (NCLB) variables affect the identification of minority students in special education. That is, are minority youth more likely to be shunted into special education classes when their schools fail to make adequate yearly progress, and/or need improvement, particularly over a period of time? Will these high standards help provide the political and legal leverage needed to improve school resources, or will high stakes testing policies be associated with higher proportions of minority students with disabilities (Heubert, 2002)? Our theoretical commitment here, and the strength of the present study, is to examine the effect of high-stakes testing associated with NCLB on minority student identification in special education, within particular soft categories.

At the same time that schools experience increase pressure to improve test scores, Title 1 schools (with at least 40% of students receiving free or reduced lunch) can receive extra support from the federal government, in the form of supplemental instruction in reading and math and funds to support family-school connections. In the latter case, Harry and Klinger (2006) reported that the schools participating in their study used Title 1 resources to hire a community involvement specialist to facilitate parent involvement in the child study and special education process, with nearly 100% of parents complying. Our study builds upon previous research by considering whether Title 1 status of a school (and the percentages of students receiving free or reduced lunch) may serve as a source of resilience for minority students, providing them with the resources they need without referral to special education.
Teacher characteristics, measured in our study at the district level, were seen as operating within the level of the exosystem. Teacher quality clearly matters; it has a profound effect on student outcomes (Darling-Hammond, 2006), including identification in special education. Teachers must integrate knowledge of subject matter, students, and context in making instructional decisions, engaging students in active learning, and reflecting on practice (Youngs, Odden, & Porter, 2003). Teachers who are most successful at achieving all of this are likely to be certified and also hold advanced degrees (Harry & Klinger, 2006).

Pianta and colleagues defined teacher quality as those characteristics affecting student development: teacher management of time and activities; interactions between teachers and students; and emotional climate in the classroom (Pianta, La Paro, Payne, Cox, & Bradley, 2002). These researchers found wide variability in teachers’ implementation of activities associated with quality, with students’ social and academic competence higher when teachers demonstrated high quality instruction (Pianta et al., 2002). Parrish (2002) sees schools depending upon special education as a resource for underachieving minority children, rather than improving the quality of instruction delivered by the schools. Yet, special education services are not a panacea for minority students, if they are consistently underfunded (Parrish, 2002). We sought to include district finances at the exosystem level, building upon previous research by examining funding at the district level for both general and special education services (Parrish, 2002; Skiba et al., 2005).

Our theoretical commitment to teacher quality was at the exosystem level, and was associated with years of teaching, teachers holding masters degrees and appropriate certification, teacher salaries, and extent of support services provided to students. At the same time, we were interested in the extent to which the racial backgrounds of teachers mattered. In that way, in measuring characteristics associated with both teacher quality and teacher race in a school district, we built upon previous research hypothesizing that both factors would be sources of resilience for minority children avoiding identification with soft disabilities in special education (Harry & Klinger, 2006).

**Macrosystem**

At the level of the macrosystem, poverty and ethnicity have been powerful variables in predicting identification in special education (Donovan & Cross, 2002). In their analysis of national data from the Office for Civil Rights of the U.S. Department of Education, Coutinho and Oswald and colleagues identified two significant predictors of MR and ED identification, working separately and in interaction: African American race and demographic variables such as poverty, income, and percentages of African Americans in the population (Coutinho, & Oswald, 1998; Coutinho & Oswald, 2005; Coutinho et al., 2002; Oswald, et al., 2002; Oswald, Coutinho, Best, & Nguyen, 2001; Oswald, Coutinho, Best, & Singh, 1999). Our theoretical commitment here was that effects of poverty are particularly strong at the community (macrosystem) levels, and that these effects ultimately find their way to the schools. Our study built upon the findings of this previous research by including measures of poverty, in isolation and interacting with school structure (elementary, middle, high school) and school race as predictors of students’ identification in special education categories. In fact, previous research has found that English language learners were underrepresented in the special education categories MR, LD, and speech and language disabilities at the elementary grade levels and overrepresented in the same special education categories at the secondary grade levels (Artiles et al., 2005). Thus, we expected increasing numbers of minority students to be identified with disabilities as grade level increased.

District size may also significantly predict identification in special education, given its influence on student achievement. The largest districts in the nation are likely to be those in urban and rural schools, which struggle with a host of factors in supporting students’ achievement (Darling-Hammond, 2006). Driscoll et al. (2003) explored the contribution of district size to student achievement in California’s school districts, and found district size to be a powerful predictor of student achievement, having a greater impact than school size, class size, proportions of children enrolled in private school, and population density. District size was a significant and negative predictor of student achievement (Driscoll et al., 2003). Because of multiple issues associated with educating children in urban schools, we included district size and locale as variables from the macrosystem. Urban, low income schools in particular can have difficulty recruiting and retaining excellent teachers to serve the neediest students (Darling-Hammond, 2006; Harry & Klinger, 2006; Krei, 1998). In addition, negative publicity associated with schools’ failure to meet NCLB standards can make the strongest teachers leave city schools Our study expands upon previous research by including all of these variables.
For the present study, we elected to focus on a set of variables at the levels of microsystem, mesosystem, exosystem, and macrosystem to help make sense of the identification of minority youth in special education, with a particular focus on the influence of schools that students attend. Our goal was to provide a broad picture, within social contexts, of environments that contribute to special education identification. Our efforts could then guide and extend research in contexts beyond those of the individual child, to make changes in special education practice at the school level.

The Illinois State Context

Since the passage of the Individuals with Disabilities Education Act (IDEA) in the mid-1970s, states have been required to carefully monitor the provision of intervention services for students with disabilities. Historically, Illinois has tended to serve a greater percentage of students with disabilities than the national average; although, like many states, many of these children were typically served in separate classrooms or separate school facilities than general education students. In 1998, following the well-known Corey H. lawsuit filed on behalf of children with disabilities in Chicago Public Schools (CPS), CPS and the Illinois State Board of Education (ISBE) were found to be in violation of the IDEA mandate to educate children with disabilities in the least restrictive environment (Designs for Change, 1998). As a result of the Corey H. settlement agreement, efforts have been made to change policy and practices at the state and local levels to increase schools’ capacity to serve children with disabilities in the least restrictive environment. For the past decade, Illinois school districts have been under more stringent reporting requirements related to the identification of students with disabilities and the settings in which they are provided with services, as well as in carefully monitoring for disproportionate representation of ethnic minority students in special education (ISBE, 2005).

In compliance with the 2004 reauthorization of IDEA and the Corey H. settlement, the state publishes an annual report on special education performance. In 2004-05 (the year of this study’s data), 15.4% of students in Illinois received special education services through Individual Education Plans (IEPs) at their public schools. Although this was an increase over the previous year, the highest incidence disabilities (learning disabilities, speech and language impairments, emotional disturbance, and mental retardation) saw a decrease in students receiving services, while Other Health Impairments and Autism showed an increase. Both White and African American students were over-represented among students receiving special education services, while Latino and Asian American students were underrepresented (ISBE, 2005). Although the state saw a slight increase in the overall percentage of students receiving services in the general education classroom, Illinois continued to serve students in less inclusive settings than the national average. Indeed, more than three-fourths of students with Mental Retardation (MR) were served outside of the general classroom or in a separate facility; similarly, approximately 30% of students with Emotional Disturbance (ED) were served in special facilities. In addition, African American students received special education service in less integrated settings than any other ethnic group, with nearly 9% of Black students receiving services in a separate educational facility (ISBE, 2005). The implications of these policies and practices are discussed in the study results below.

Research Questions and Hypotheses

Our specific research questions were as follows:

1) How do gender, race, and their interactions predict identification in special education (MR, ED, LD), independent of school and district level variables?

2) How do race and gender and their interactions predict identification in special education for students nested within schools, when considered with school and district level variables?

We hypothesized that in our prediction of special education identification using individual characteristics only (question one) we would find patterns comparable to those identified by previous research: that boys and African American students would be overrepresented in all categories and that Asian American and Latino students would be underrepresented. We also expected that interactions between race and gender would predict special education identification in all categories, particularly in the case of African American males.

With regard to question two, exploring the effects of individual student characteristics (race and gender and their interactions) in conjunction with school and district data, we hypothesized the following effects. At the microsystem level, we expected that race and gender would continue to be significant and positive predictors of special education identification. At the mesosystem level, we expect that school
race would have a significant effect, with majority Black and majority Latino schools acting as positive predictors for special education identification. Although we anticipated that student-teacher race match might act as a significant predictor of special education identification, we were cautious about this prediction because student race was measured at the school level, whereas teacher race was only available at the district level. We also expected that parent and family variables would act as significant predictors of special education identification, with parent involvement and family income acting as negative predictors and attendance, truancy, and mobility acting as positive predictors.

At the exosystem level, we expected variables associated with NCLB to be significant predictors in predicting special education identification, with school made AYP a negative predictor, and the remaining NCLB variables positive predictors (school needs improvement, years in school improvement). We expected that variables measuring family income at school and district level financing variables would be positive predictors. We expected characteristics associated with teacher quality (certification, experience, advanced degrees) to be negative predictors of special education identification. Teacher race at the school level may reflect district and school level policies about the education of minority students; thus, we included this variable in the model.

At the macrosystem level, we expected school structure (elementary, middle, high) to be significant predictors of special education identification, with elementary and middle school status acting as positive predictors, and high school acting as a negative predictor. We expected poverty to be a negative predictor of special education identification, and were interested to see whether poverty would interact with school structure and race. With regard to community structure, we expected large city and rural areas to be significant, positive predictors of special education identification.

The Use of Hierarchical Linear Modeling

The majority of studies in ethnic disproportionality using large samples have employed linear regression techniques; yet those techniques are limited, in that they require investigators to assume that individuals function independently from their schools and communities. Yet, students clearly function within the context of their schools, and hierarchical linear modeling (HLM) can account for this (Duncan & Raudenbush, 1999; Raudenbush & Bryk, 2002). HLM explicitly accounts for individuals’ dependency within schools and the fact that students tend to cluster within schools (Raudenbush & Bryk, 2002). As a result, the HLM provides a means to better estimate individual level effects and to draw more accurate conclusions from the results (Raudenbush & Bryk, 2002). We tested two models using HLM. The first, model one, employed student characteristics only to predict identification in the three special education categories. For model two, we considered student characteristics (gender, race, and their interactions) in conjunction with school and district characteristics to predict special education identification.

Method

Subjects

Subjects in the study were 1,394,024 students who attended 2,104 elementary, middle, and high schools in Illinois during the 2004-05 school year. Data describing the race and gender of students with MR, ED, and LD, as well as school enrollment data, was provided to us by the Office for Civil Rights (OCR) in the United States Department of Education. Table 1 presents descriptive information about the student population in the present study.

Data Sources

Every two years, the Office for Civil Rights (OCR) collects responses to the Elementary and Secondary School survey from a nationally representative sample of school districts across the country (U.S. Department of Education, Office for Civil Rights, 2005). For the purpose of this study, we used student enrollment, race, gender, and disability status in the state of Illinois from the 2004-2005 school year to create our individual level data file; these were the most recent data available from the OCR during the time we conducted the study. The OCR provided data for 2,447 schools in Illinois from that year. Data describing the schools were retrieved from the Illinois State Board of Education (ISBE) School Report Cards (http://www.isbe.state.il.us). ISBE provided data for 3,854 schools from the 2004-2005 school year. Additional school community data, such as school locale (large city, urban fringe, rural, etc.) and median family income were drawn from the Common Core of Data of The National Center for Educational Statistics (NCES) for the same year (http://nces.ed.gov/ccd). The Common Core of data contains information on 15,041 school districts across the country. Datasets were linked using NCES
school and district identification codes and Illinois state school IDs. Variables included in the model and measured at each of the levels of Bronfenbrenner’s model are described in Table 2.

**Examining Individual and Contextual Influences with Hierarchical Linear Modeling**

To address our research questions, we used a series of models to examine individual versus contextual variables. Model one addressed Question 1, examining how gender, race, and their interactions predicted identification in special education (for MR, ED, and LD) without controlling for Level 2 school context variables (i.e., assuming that all Level 2 variables provide nonsignificant predictors). At the student level, we including an indicator of male (1=male, 0=female), indicators of Asian, Latino, African-American, and White ( zeroes in these four race categories indicate Native American), and all possible pairwise interactions between all these indicators.

### Table 1. Distribution of cases by gender, race, and disability category

<table>
<thead>
<tr>
<th>Girls</th>
<th></th>
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</tr>
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<tbody>
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<td>ED</td>
<td>LD</td>
<td>NONE</td>
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<tr>
<td>African American</td>
<td>4110</td>
<td>1592</td>
<td>9648</td>
<td>16125</td>
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<td>7445</td>
<td>143488</td>
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<tr>
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<td>9</td>
<td>59</td>
<td>1155</td>
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<tr>
<td>White</td>
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<td>2172</td>
<td>15505</td>
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<td>33031</td>
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<th></th>
<th></th>
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</thead>
<tbody>
<tr>
<td>Race</td>
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<td>ED</td>
<td>LD</td>
<td>NONE</td>
</tr>
<tr>
<td>African American</td>
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<td>5125</td>
<td>17793</td>
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<tr>
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<td>13401</td>
<td>59989</td>
<td>628020</td>
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</table>

### Table 2. Study variables within Bronfenbrenner’s nested ecological system (1977; 1979)

<table>
<thead>
<tr>
<th>System Level</th>
<th>Variable Group</th>
<th>Variable Name</th>
</tr>
</thead>
<tbody>
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<td><strong>Microsystem</strong></td>
<td>Student Group</td>
<td>Gender</td>
</tr>
<tr>
<td></td>
<td>Characteristics</td>
<td>Race</td>
</tr>
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<td><strong>Mesosystem</strong></td>
<td>School Race</td>
<td>Majority Black student body</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Majority Latino student body</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Majority White student body</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Diverse student population (no majority)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Limited English Proficient students (%)</td>
</tr>
<tr>
<td></td>
<td>Student-teacher race match (interactions)</td>
<td>Majority Black students x majority White teaching staff</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Majority Black students x majority teachers of color</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Majority Latino students x majority White teaching staff</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Majority Latino students x majority teachers of color</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Majority White students x majority teachers of color</td>
</tr>
<tr>
<td><strong>Parent and family</strong></td>
<td>Parent involvement (school %)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Student attendance rate (school %)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Student mobility rate (school %)</td>
<td></td>
</tr>
</tbody>
</table>
Note. Unless otherwise noted, categorical variables were dummy coded determining inclusion, such that 1=yes (i.e., for elementary school); 0=otherwise.

To address our second question, examining how race and gender and their interactions predict identification in special education when considered with a range of school and district factors, we performed a two level multinomial logit HLM analysis, with students nested within schools. The technical details about this approach to HLM are available in Raudenbush and Bryk (2002, Chapter 10). Having described the student level and school level variables, the aim of the HLM analysis was to
identify which of these variables would significantly predict student identification in either MR, ED, LD, compared to no disability (the referent category), and to characterize the relationship between these predictors with student identification. To maintain interpretability in data analysis, we decided to construct a two-level model that includes student-level predictors at level one and both school-level and district level variables at level two.

In the HLM analysis, parameters were estimated via maximum likelihood, and we used a variable selection algorithm to identify significant predictors. In particular, we used an iterative, backward elimination algorithm, where at the first stage, all predictors were included in the model. At each iterative stage, a likelihood-ratio test was performed between an HLM model that included the predictor having the smallest \( t \) value (\( t \) denotes the t ratio), against an HLM model that excluded that predictor. If the test was not significant at the .05 level, we proceeded to the next stage using an HLM that excluded this predictor and performed a different likelihood-ratio test involving a new the predictor having the smallest \( t \) value. Otherwise, if the test was not significant, the iterative process stopped. The HLM model determined at the end of this iterative process was identified as the model containing only the variables that provide significant predictors of student identification in MR, ED, or LD, compared to no disability (a referent category).

Among the 3,854 schools, there was a small percentage of missing data for each of the 45 school level predictor variables. Assuming the data were missing at random (i.e., the occurrence of missing values depended on the observed values of the school level predictors), we imputed these missing values using predictions from a multivariate normal model fitted to the observed (non-missing) values (Little & Rubin, 2002). For the HLM analysis, we were able to analyze 2,104 of the 3,854 schools, because there were 1,750 missing schools providing no student level data. This sample represents about two-thirds of public schools in Illinois in the 2004-05 school year. These data are indicative of the representative sampling of schools by OCR every two years (Oswald et al., 2002), compared with the complete set of Illinois public schools with ISBE School Report Cards. Table 3 presents the descriptive statistics of all the school level variables for the 2,104 non-missing schools. We also performed a separate logistic regression analysis of all the 3,854 schools, with the dependent variable indicating whether the indicator whether the school was missing. We found that compared to the missing schools, the non-missing schools set had significantly fewer majority Black schools, fewer Title 1 schools, and fewer schools in the district in school improvement status, as well as lower levels of student mobility, family income, and teaching experience. Non-missing schools had significantly more schools in small and large districts. In addition, these schools tended to have somewhat greater enrollments, higher teacher pay, and more years in school improvement status than schools with missing data. Considering the impact of factors such as family income, achievement status, and teacher experience on identification of students with disabilities, these differences suggest a possible under sampling of students with disabilities in the current sample. As a result, we felt it important to examine the distribution of students with disabilities in the study sample compared with incidence rates reported by the state. Results from this analysis are reported below.

**Results**

Analysis of data from the 2,104 available schools included 1,394,024 student cases. Overall, our sample included 9.5% of students across the three disability categories of mental retardation, emotional disturbance, and learning disabilities. The percent of students in each disability category was 1.53%, 1.27%, and 6.67% for MR, ED, and LD, respectively. The published Illinois Special Education Profile for the 2004-05 school year noted incidence rates of 1.73%, 1.22%, and 7.13%. Statistical comparison of the distribution of students with disabilities in the study sample with expected proportions reported by for the state revealed no significant differences, \( \chi^2 (3, N = 8) = 0.72, p > .05 \).

**Model I: Student level Predictors of Special Education Identification**

Table 4 presents the results from model one, as well as the intermediate analyses between models one and two, showing the odds ratios with and without school predictors in the model. We selected a .05 significance level for this analysis. A variable with a positive coefficient indicates that an increase in the variable is associated with an increase in the probability of classifying a student in the given category, while controlling for all other significant predictors in the model. A variable with a negative coefficient indicates that an increase in the variable is associated with a decrease in the probability of classifying a student in the given category, while controlling for all other significant predictors in the model. The HLM analysis allowed us to address how the student level variables predicted student identification in the special education categories of mental retardation (MR), emotional disturbance (ED), and learning...
disabilities (LD), compared to the no disability category (the referent category). As expected, race and gender were significant predictors of disability status across all categories in model one. Asian students, in general, were significantly less likely to be identified for special education across all categories. In contrast, African American and White boys were significantly more likely to be classified as MR. For the category of ED, Asian and Latino students, overall, were less likely to be identified. However, the interaction between race and gender revealed a significantly greater likelihood of Latino boys being classified as emotionally disturbed. For the category of LD, race and gender continued to be significant predictors, with African American students and boys having significantly greater odds of being identified as learning disabled.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>s.d.</th>
<th>Variable</th>
<th>Mean</th>
<th>s.d.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Elementary School</td>
<td>.61</td>
<td>.49</td>
<td>Support services available</td>
<td>29.82</td>
<td>6.41</td>
</tr>
<tr>
<td>High School</td>
<td>.20</td>
<td>.40</td>
<td>School achievement</td>
<td>70.97</td>
<td>15.53</td>
</tr>
<tr>
<td>Small District</td>
<td>.17</td>
<td>.37</td>
<td>School made AYP</td>
<td>.84</td>
<td>.37</td>
</tr>
<tr>
<td>Large District</td>
<td>.35</td>
<td>.48</td>
<td>School needs improvement</td>
<td>.06</td>
<td>.25</td>
</tr>
<tr>
<td>Majority White Students</td>
<td>.81</td>
<td>.39</td>
<td>Years on improvement status</td>
<td>.19</td>
<td>.81</td>
</tr>
<tr>
<td>Majority Black Students</td>
<td>.06</td>
<td>.24</td>
<td>Title 1 Schools in district</td>
<td>59.72</td>
<td>30.76</td>
</tr>
<tr>
<td>Majority Latino Students</td>
<td>.03</td>
<td>.17</td>
<td>Schools in district on improvement status</td>
<td>7.83</td>
<td>20.54</td>
</tr>
<tr>
<td>Enrollment</td>
<td>360.97</td>
<td>199.72</td>
<td>Large city</td>
<td>.02</td>
<td>.14</td>
</tr>
<tr>
<td>LEP Students</td>
<td>2.85</td>
<td>7.72</td>
<td>Urban fringe</td>
<td>.38</td>
<td>.49</td>
</tr>
<tr>
<td>Low Income Students</td>
<td>31.14</td>
<td>22.93</td>
<td>Midsize city</td>
<td>.10</td>
<td>.30</td>
</tr>
<tr>
<td>Parent Involvement</td>
<td>97.47</td>
<td>5.87</td>
<td>Rural community</td>
<td>.38</td>
<td>.49</td>
</tr>
<tr>
<td>Student Attendance</td>
<td>94.80</td>
<td>2.18</td>
<td>Per-pupil expenditure</td>
<td>9230.39</td>
<td>2463.18</td>
</tr>
<tr>
<td>Student Mobility</td>
<td>14.74</td>
<td>11.38</td>
<td>Support service expenditure</td>
<td>325.12</td>
<td>210.03</td>
</tr>
<tr>
<td>Student Truancy</td>
<td>1.45</td>
<td>3.63</td>
<td>Mean family income</td>
<td>56253.50</td>
<td>20936.70</td>
</tr>
<tr>
<td>Majority teachers of color</td>
<td>.01</td>
<td>.11</td>
<td>Percent below poverty</td>
<td>13.35</td>
<td>9.41</td>
</tr>
<tr>
<td>Male teachers</td>
<td>20.90</td>
<td>8.65</td>
<td>Majority Black students x majority white teachers</td>
<td>.04</td>
<td>.18</td>
</tr>
<tr>
<td>Teaching Experience</td>
<td>14.42</td>
<td>2.62</td>
<td>Majority Latino students x majority white teachers</td>
<td>.02</td>
<td>.15</td>
</tr>
<tr>
<td>Teachers with Masters Degrees</td>
<td>39.87</td>
<td>17.21</td>
<td>Majority Latino students x majority teachers of color</td>
<td>.001</td>
<td>.03</td>
</tr>
<tr>
<td>Pupil:Staff Ratio</td>
<td>13.22</td>
<td>2.08</td>
<td>Maj White students x poverty</td>
<td>9.75</td>
<td>7.97</td>
</tr>
<tr>
<td>Teacher salary</td>
<td>48045.29</td>
<td>8647.84</td>
<td>Maj. Black students x poverty</td>
<td>1.60</td>
<td>7.86</td>
</tr>
<tr>
<td>Emergency Certificates</td>
<td>.92</td>
<td>2.83</td>
<td>Maj. Latino students x poverty</td>
<td>.62</td>
<td>3.79</td>
</tr>
<tr>
<td>Classes with Non-Highly Qualified Teachers</td>
<td>.78</td>
<td>4.83</td>
<td>Poverty x Elementary School</td>
<td>7.89</td>
<td>9.65</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Poverty x High School</td>
<td>3.09</td>
<td>7.45</td>
</tr>
</tbody>
</table>

Note: Variables that appear in Table 1 but do not appear in Table 3 served as referent categories for the dummy coded variables (i.e., middle school served as referent for elementary and high school).

Model II: Individual and Contextual Predictors of Special Education Identification

Table 5 presents the results of the significant predictors of identification in MR, ED, and LD categories, after application of the HLM analysis with the backward variable-selection algorithm described in the previous section. Because of the large numbers of variables, we selected a p < .01 level for this analysis. As was the case in model one, a variable with a positive coefficient indicates that an increase in the
variable is associated with an increase in the probability of classifying a student in the given category, while controlling for all other significant predictors in the model. A variable with a negative coefficient indicates that an increase in the variable is associated with a decrease in the probability of classifying a student in the given category, while controlling for all other significant predictors in the model.

The HLM analysis allowed us to address how the student level and school level variables predicted student identification in the special education categories of mental retardation (MR), emotional disturbance (ED), and learning disabilities (LD), compared to the no disability category (the referent category).

In contrast to model one, results revealed that race, gender, and their interactions did not significantly predict student identification with ED, LD, or MR once students were nested within their schools and school level variables were considered in the model. However, a number of school level variables were found to significantly predict identification in each of the three disability categories. School attendance rate was a significant negative predictor for all three special education categories; as attendance rate increased among schools, the probability of students being classified in each of the special education categories decreased.

For the category of MR, school mobility rate was a significant positive predictor; as the school mobility rate increased, the probability of students being classified with MR also increased. In addition, teacher education and adequate yearly progress (AYP) was significant negative predictors for MR identification; students were less likely to be classified with MR in schools with a greater percentage of teachers who had Masters Degrees and in schools making AYP. Finally, size and locale of the district in which the school was located were both significant negative predictors for MR; among schools in large and midsize cities and schools on the urban fringe, the probability of students being classified with MR decreased. Students in rural schools were also less likely to be identified with MR.

For the category ED, the proportion of students from low income families was a significant negative predictor; as the percentage of low income students increased, the probability of students being classified with ED decreased. In addition, average teacher salary for the district was a significant positive predictor of ED; schools with higher average teacher salaries were associated with a greater likelihood of ED identification.

For the category LD, district size was a significant predictor. For schools in small districts, the probability of students being classified with LD increased, whereas among schools in large districts, the probability of students being classified with LD decreased. Pupil-to-certified staff ratio was a negative predictor for LD; as pupil to certified staff ratios increased, the probability of students being classified with LD decreased.

What is particularly striking is the stability of odds ratios from the first model to the second. Odds ratios, which are also indicators of effect size, do not change much from model one to model two. Yet what do change are the levels of significance of race and gender predictors from the first model to the second. Across special education categories in model one, categories of race and gender are significant; with school predictors in the second model, those categories become nonsignificant, even as odds ratios remain the same.
Table 4. Predictors of special education identification: A comparison of results for two multinomial logit models. The first model contains only level-1 student predictors. The second model adds chosen school-level predictors, presented in the final model of Table 5.

### Predictors of Identification in Mental Retardation

<table>
<thead>
<tr>
<th>Without School Predictors</th>
<th>With School Predictors</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Coefficient(S.E.)</strong></td>
<td><strong>p-value</strong></td>
</tr>
<tr>
<td>Intercept</td>
<td>-4.08 (.35)</td>
</tr>
<tr>
<td>African American</td>
<td>.36 (.35)</td>
</tr>
<tr>
<td>Asian</td>
<td>-1.17 (.36)</td>
</tr>
<tr>
<td>Latino</td>
<td>-.67 (.36)</td>
</tr>
<tr>
<td>White</td>
<td>-.55 (.36)</td>
</tr>
<tr>
<td>Male</td>
<td>-.68 (.50)</td>
</tr>
<tr>
<td>African American Male</td>
<td>1.08 (.50)</td>
</tr>
<tr>
<td>Asian Male</td>
<td>.82 (.50)</td>
</tr>
<tr>
<td>Latino Male</td>
<td>0.96 (.50)</td>
</tr>
<tr>
<td>White Male</td>
<td>1.01 (.50)</td>
</tr>
</tbody>
</table>

### Predictors For Identification in Emotional Disturbance

<table>
<thead>
<tr>
<th>Without School Predictors</th>
<th>With School Predictors</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Coefficient(S.E.)</strong></td>
<td><strong>p-value</strong></td>
</tr>
<tr>
<td>Intercept</td>
<td>-4.95 (.36)</td>
</tr>
<tr>
<td>African American</td>
<td>0.20 (.37)</td>
</tr>
<tr>
<td>Asian</td>
<td>-1.40 (.41)</td>
</tr>
<tr>
<td>Latino</td>
<td>-1.02 (.37)</td>
</tr>
<tr>
<td>White</td>
<td>-0.09 (.37)</td>
</tr>
<tr>
<td>Male</td>
<td>0.37 (.46)</td>
</tr>
<tr>
<td>African American Male</td>
<td>0.84 (.46)</td>
</tr>
<tr>
<td>Asian Male</td>
<td>0.64 (.51)</td>
</tr>
<tr>
<td>Latino Male</td>
<td>0.90 (.46)</td>
</tr>
<tr>
<td>White Male</td>
<td>0.68 (.46)</td>
</tr>
</tbody>
</table>

### Predictors of Identification in Special Learning Disability

<table>
<thead>
<tr>
<th>Without School Predictors</th>
<th>With School Predictors</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Coefficient(S.E.)</strong></td>
<td><strong>p-value</strong></td>
</tr>
<tr>
<td>Intercept</td>
<td>-2.95 (.20)</td>
</tr>
<tr>
<td>African American</td>
<td>0.13 (.20)</td>
</tr>
<tr>
<td>Asian</td>
<td>-1.35 (.21)</td>
</tr>
<tr>
<td>Latino</td>
<td>-0.01 (.20)</td>
</tr>
<tr>
<td>White</td>
<td>-0.02 (.20)</td>
</tr>
<tr>
<td>Male</td>
<td>0.37 (.16)</td>
</tr>
<tr>
<td>African American Male</td>
<td>0.31 (.16)</td>
</tr>
<tr>
<td>Asian Male</td>
<td>0.21 (.17)</td>
</tr>
<tr>
<td>Latino Male</td>
<td>0.21 (.16)</td>
</tr>
<tr>
<td>White Male</td>
<td>0.21 (.16)</td>
</tr>
</tbody>
</table>

Note. All coefficients reported are unstandardized, and reported with robust standard errors (S.E.). For the first and second model, the p-value is based on a t-statistics with 32,171 and 32,156 degrees of freedom, respectively.
Table 5. Maximum-likelihood estimates of the coefficients in the HLM multinomial-logit model, which included the significant predictors of student identification.

<table>
<thead>
<tr>
<th>Significant predictors of Mental Retardation (MR) identification</th>
<th>Predictor</th>
<th>Coefficient (S.E.)</th>
<th>p-value</th>
<th>Odds Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>4.80 (.74)</td>
<td>.00</td>
<td>121.50</td>
<td></td>
</tr>
<tr>
<td>Student Attendance</td>
<td>-.08 (.01)</td>
<td>.00</td>
<td>.92</td>
<td></td>
</tr>
<tr>
<td>Student Mobility</td>
<td>.01 (.00)</td>
<td>.00</td>
<td>1.01</td>
<td></td>
</tr>
<tr>
<td>Teachers with Masters degrees</td>
<td>-.01 (.01)</td>
<td>.01</td>
<td>.99</td>
<td></td>
</tr>
<tr>
<td>School made AYP</td>
<td>-.51 (.10)</td>
<td>.00</td>
<td>.60</td>
<td></td>
</tr>
<tr>
<td>Large City</td>
<td>-.97 (.17)</td>
<td>.00</td>
<td>.37</td>
<td></td>
</tr>
<tr>
<td>Urban fringe</td>
<td>-.71 (.16)</td>
<td>.00</td>
<td>.49</td>
<td></td>
</tr>
<tr>
<td>Midsize city</td>
<td>-.51 (.17)</td>
<td>.00</td>
<td>.60</td>
<td></td>
</tr>
<tr>
<td>Rural community</td>
<td>-.71 (.25)</td>
<td>.01</td>
<td>.49</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Significant predictors of Emotional Disturbance (ED) identification</th>
<th>Predictor</th>
<th>Coefficient (S.E.)</th>
<th>p-value</th>
<th>Odds Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>2.86 (.64)</td>
<td>.00</td>
<td>17.38</td>
<td></td>
</tr>
<tr>
<td>Low Income Students</td>
<td>-.006</td>
<td>.00</td>
<td>.99</td>
<td></td>
</tr>
<tr>
<td>Student Attendance</td>
<td>-.09 (.01)</td>
<td>.00</td>
<td>.91</td>
<td></td>
</tr>
<tr>
<td>Teacher salary</td>
<td>.00003 (.00)</td>
<td>.00</td>
<td>1.00</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Significant predictors of Learning Disability (LD) identification</th>
<th>Predictor</th>
<th>Coefficient (S.E.)</th>
<th>p-value</th>
<th>Odds Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>4.83 (.30)</td>
<td>.00</td>
<td>124.61</td>
<td></td>
</tr>
<tr>
<td>Small district</td>
<td>.33 (.09)</td>
<td>.00</td>
<td>1.39</td>
<td></td>
</tr>
<tr>
<td>Large district</td>
<td>-.27 (.04)</td>
<td>.00</td>
<td>.77</td>
<td></td>
</tr>
<tr>
<td>Student Attendance</td>
<td>-.07 (.00)</td>
<td>.00</td>
<td>.93</td>
<td></td>
</tr>
<tr>
<td>Pupil:Staff Ratio</td>
<td>-.03 (.01)</td>
<td>.00</td>
<td>.97</td>
<td></td>
</tr>
</tbody>
</table>

Note. All coefficients reported are unstandardized, and reported with robust standard errors (S.E.). All p-values are based on t-statistics with 32,183 degrees of freedom.

Discussion

We employed Bronfenbrenner’s (1977; 1979; 1992) theory of nested ecological systems to better understand the complex influence(s) of the larger school context on minority student identification in special education. We looked predominately at the broad contextual influences of schools with a large number of students within the multilevel system that is Bronfenbrenner’s model. We found that when one considers students nested within schools, which are then described by variables from these multilevel contexts, with all variables entered simultaneously in a model to predict special education identification, that school variables — not race and gender — become the significant predictors of MR, ED, and LD.

Previous research had focused on characteristics of the individual child and family as responsible for the development of disabilities (see Harry & Klinger, 2006), with race and gender, particularly in the categories of MR and ED, all significant. Yet our results reveal that race and gender of individuals do not tell the whole story; that indeed school factors from multiple levels of influence can explain the identification of children and youth with disabilities. Our application of Bronfenbrenner’s multilevel theoretical model coupled with HLM analyses helped us to see student race and gender within the schools, guide our selection of multilevel variables to describe the schools, and ultimately identify which variables in a multilevel system contributed to special education identification.
Previous quantitative research had focused solely on odds ratios or other risk indices (Artiles et al., 2005; Losen & Orfield, 2002) or included individual student characteristics alongside school predictors (Coutinho & Oswald, 1998; Coutinho & Oswald, 2005; Coutinho et al., 2002; Oswald et al., 1999, 2001, 2002, 2003; Skiba et al., 2005), without first nesting students within the schools they attend. Previous qualitative research had pointed to the potential for school policies to drive minority student identification in special education (Donovan & Cross, 2002); and Darling-Hammond (2006) had drawn the attention of the nation to the savage inequalities of American schooling for minority children compared to their White peers (Kozol, 1991).

In our initial HLM analysis using race, gender, and their interactions only as predictors, race and gender continued to contribute to identification for special education. Our hypotheses about the predictive value of race and gender across disability categories only held in some cases. As expected, Asian American students were less likely to be identified across all categories, while Latino students were only significantly underrepresented in ED. With respect to gender, male was significant for the LD category only. We had expected that interactions between race and gender would be significant, particularly for African American males. However, this only held true for African American males in the category of MR. Odds ratios do indicate that African American males were at greater risk for identification with ED and LD, but the finding did not reach significance. This particular pattern of findings could be due to our sampling of fewer predominately Black and lower income schools.

However, our findings from model two that school variables from multiple theoretical levels were significant predictors of special education identification clearly deviated from previous research. In the second HLM analysis, we did not find race and gender acting as significant predictors of student identification in MR, in ED, and in LD. Instead, school factors from multiple levels were significant. Furthermore, and in line with previous research, significant school level predictors differed for the MR, ED, and LD categories (with the exception of school attendance rate).

Following Bronfenbrenner’s model, we found that significant school effects occurred at the level of the mesosystem (school attendance and mobility), exosystem (resources provided to schools as measured by whether schools made AYP, whether teachers held Masters degrees, and the ratio of pupils: certified staff), and macrosystem (school district size and type of community). In previous research, individual social address (particularly race and gender) had largely driven minority student representation in special education.

A methodological reason for our findings may be the sheer ability of so many variables from the school level to absorb variance in the model. A substantive explanation is that school and school policy contexts within Bronfenbrenner’s model dwarfed the effects of individual characteristics of race and gender, given the well-established finding that minority students are more likely than their White peers to attend poorer, less well funded schools (Darling-Hammond, 2006).

Our findings have the potential to shift the focus from blaming minority children and their families for the emergence of low achievement and disabilities to placing greater responsibility on schools and school policies that directly affect them (Harry et al., 2005). Some theorists see this as an improvement over blaming the victim (McDermott & Varenne, 1995); we see this as an essential path to intervention for minority children and youth. School is the setting where important policy decisions are aimed at addressing disproportionate representation of minority students in special education (Hosp, 2009). Yet educational policy tends to focus on punishing students and teachers for failing to meet academic standards (Heubert, 2002), rather than supporting schools, teachers, and students by providing them with access to high quality, certified teachers in schools, where parents want their children to attend and remain. Urban schools in large districts are most likely to be on the punishing end of national school policies; despite spending more money, they obtain less in the way of buying power for the money they do spend (Parrish, 1996). Urban schools, then, are currently less able than their suburban counterparts to hire and retain qualified teachers (Darling-Hammond, 2006). These are the schools that minority students disproportionately attend.

Previous work had found that poverty was not a significant predictor of special education identification for minority students (Skiba et al., 2005), or that income levels mattered only when proportions of
African Americans in the population were also considered (Oswald et al., 1999). Our study extended these findings, by discovering that predictors associated with resources to schools were significant, whereas variables directly measuring poverty and income were not. In that way, our study provides evidence to support one component of the NRC model of student achievement: policy influences on teachers. In their report, Donovan and Cross (2002) identified certification requirements, as well as resources for salaries and professional development having influences on teaching; our results directly support that part of their model. Furthermore, our work was a direct response to the question posed by the NRC, regarding whether the school experience itself contributed to racial disproportion in academic outcomes and behavioral problems that lead to placement in special and gifted education (Donovan & Cross, 2002, p. 358). Our results answered that question in the affirmative.

Limitations

The present study did focus on the effects of broad, multilevel school context variables on minority student identification in special education. Yet, we were not able to address important variables likely to affect disproportionate representation in the present study, especially those at the microsystem level. These include quality of classroom instruction and class management (Harry & Klinger, 2006); quality of teacher-student relationships (Decker et al., 2007; Hamre & Pianta, 2001; Harry & Klinger, 2006); culturally responsive teaching (Gay, 2000) and the use of appropriate assessment methods, particularly for English language learners (Harry & Klinger, 2006). In addition, our measurement of teacher ethnicity at the district level and student ethnicity at the school level did not create a sound theoretical match, thereby possibly obscuring a potentially powerful finding. These variables, largely all occurring at the level of the microsystem, need further exploration, particularly in the context (as our study reveals) of varying levels of resources provided to the schools. In addition, we did have missing data for 1,750 of the schools from our original sample. These missing schools did differ significantly from non-missing schools on important variables and consisted of a slight undersampling of students with learning disabilities, which may have affected our overall findings.

Significance of School Attendance Rate

In our second HLM model, school attendance rate was a significant, negative predictor for all three special education categories; meaning that, as attendance rate increased in a given school, the probability of students’ identification in each of the three categories decreased. This finding extends previous research that has focused on the role of the family in the special education process at the level of the microsystem (Harry et al., 2005; Harry & Klinger, 2006). Harry and colleagues have interviewed, observed, and visited families in the home, offering a unique perspective on their experiences. We selected student attendance rate as a family measure at the mesosystem level, which is a variable that schools can track and are required to report. Attendance turns out to be a powerful variable, indicative of important components of a school’s functioning. First, student attendance has the potential to affect the learning environment of an entire school, because school funding is often directly tied to the number of students who regularly attend (Epstein & Sheldon, 2002). Students who attend regularly outperform their peers on standardized tests, thereby contributing to a school’s ranking and success (Lamdin, 1996; Sheldon, 2007).

Student attendance can also be indicative of the quality of the classroom context, including the extent to which classes are chaotic or well organized. Likewise, student attendance can reflect the quality of student-teacher relationships (Epstein & Sheldon, 2002). Finally, student attendance may be strongly associated with parent involvement in a school. Epstein and colleagues have found that across 39 elementary schools, the quality of family, school, and community partnership programs was associated with rates of student attendance (Epstein, Clark, Salinas, & Sanders, 1997). Furthermore, Epstein and Sheldon have found that attendance in both urban and rural schools significantly improves through interventions focused on boosting family and community involvement (Epstein & Sheldon, 2002; Sheldon, 2007).

Not only is rate of attendance an important predictor of special education identification, it also appears to be a risk factor for students with disabilities. Attendance appears to be a powerful variable, reflecting important processes within schools and families and likely reflecting, in part, strong school and community partnerships. Most important, unlike race, poverty, and gender, student attendance is a school and community level variable that can be changed. Of course, student attendance becomes a risk factor when it is viewed as solely the responsibility of families, rather than as a shared responsibility of families and schools.
**Significant Predictors of Mental Retardation**

In the first HLM model, we found that the categories female of other race and Asian students served as negative predictors of MR, whereas African American and White Male students served as positive predictors. These are patterns of identification by race and gender that we would expect to find. Yet, when multiple school variables were included in the second model, we found that race and gender were no longer significant predictors.

In addition to attendance rate, we found four more positive predictors of MR identification in the second model. Two of the four significant school predictors (i.e., positive association with mobility rate and negative association with whether schools made AYP) appear to indicate a pattern of association with student achievement and family income. We found that, as school mobility rates increased, the probability of students being classified with MR increased. This finding also extends previous research that has focused on the family in the special education process at the level of the microsystem (Harry et al., 2005; Harry & Klinger, 2006). School mobility has had strong, consistent associations with student achievement (Heinlein & Shinn, 2000). In a large sample of urban youth followed from third through sixth grades, Heinlein and Shinn (2000) found a strong, negative association for high levels of student mobility with reading and math achievement in sixth grade. In fact, students who moved two-to-three times within a given school year were likely to experience declining achievement test scores of 20 or more percentile points from third to sixth grades (Heinlein & Shinn, 2000). Furthermore, early mobility appeared to be more disruptive than later mobility, with mobility prior to third grade a more potent predictor than later mobility (Heinlein & Shinn, 2000). Like attendance, student mobility becomes a significant risk factor when it is viewed as the sole responsibility of families. When families feel connected to schools and schools are serving their children well, they will be less likely to move.

Similarly, we found a negative association between whether schools made adequate yearly progress (AYP) and identification of students as MR, indicating that if schools did not make AYP, the probability of students being classified as MR increased. However, we also found a negative association between whether schools were located in the urban fringe or in large cities and identification of students with MR. The significance and direction of these two variables appears to be contradictory, with large cities more frequently associated with poverty and lower achievement in schools (Driscoll, Halcoussis, & Svorny, 2003) and urban fringe more frequently associated with higher income and achievement. Yet the urban fringe is heterogeneous, and in the Chicago area, densely populated.

Population density may provide some insight to our findings. Driscoll et al. (2003) found that population density was a key factor in predicting student achievement across all schools in California, with urban schools having a more difficult time producing adequate-to-high levels of student achievement. It could be that schools in both large cities and on the urban fringe in Illinois share characteristics of population density that can affect identification of students with MR. Not only are these the districts most likely to be populated by minority students, they are also the districts that spend the most per student and get the least per dollar in the way of buying power (Parrish, 1996). Our work extends findings from previous research by making a connection between large, urban schools in densely populated centers and identification of children with MR.

**Significant Predictors of Emotional Disturbance**

In the first HLM model, we found that the categories female of other race and Asian students served as negative predictors of ED, whereas the category of Latino served as a negative predictor, and the category of Latino Male served as a positive predictor. This is intriguing, given that in the second HLM model, we found patterns of school and demographic characteristics for identification of students with ED closely matching findings from previous research with African American students (i.e., Oswald et al., 1999). In addition to a negative association between attendance rate and the probability of student identification with ED, we found that school low income status had a negative association and average teacher salary for the district had a positive association with ED identification. Our work extends the findings of Oswald and colleagues (1999) who found similar patterns related to district income for predicting identification as ED, particularly for African American students in low poverty, more affluent districts. For example, in lower poverty school districts with few African-American students, African-Americans were much more likely than non African-American students to be identified with ED (Oswald et al., 1999). Granted, we did not find a contribution for race at the individual or school level in the second model, nor for their interaction. But significant findings for identification of Latino youth in the first model suggest that increased rates in school population of Latinos in the past ten years may be
contributing to their disproportionate representation in the ED category in Illinois, ten years after the Oswald study. Stigmas for children and youth with ED and mental health problems clearly persist; and the identification of these youth appears directly tied to sociodemographic variables.

**Significant Predictors of Learning Disabilities**

In the first HLM model, we found that the categories female of other race and Asian students served as negative predictors of LD, whereas the category of Male served as a positive predictor. Again, when multiple school variables were included in the second model, we found that race and gender were no longer significant predictors of LD. In the second HLM model, in addition to a negative association between attendance rate and the probability of student identification with LD, we found significant associations with district size and the probability of students being classified with LD (small districts having a positive association and large districts having a negative association), as well as a significant negative association between pupil:certified staff ratio in the district and the probability of students being classified with LD.

These findings for prediction of LD at the macrosystem level (district size, pupil:staff ratio) may simply be an indirect measure of wealth of the district. Skiba et al. (2005) found that richer districts tended to have higher rates of ethnic disproportionality in LD. Our work builds on this finding by connecting an indirect level of resources to student identification with LD. This is not unlike the pattern of findings we obtained for the prediction of ED.

Principals and teachers in smaller districts may have the resources and support to be more innovative and flexible in serving children with LD; they may simply have fewer layers of bureaucracy; they may simply know their students better. The negative association we found between pupil:certified staff ratio in the district and identification of students with LD suggests that the academic needs of students are being well met in these districts, perhaps obviating the need for LD services.

Our study addressed an additional layer of the complexity of minority student identification in special education. We used a multilevel theoretical model to consider school influences, applying HLM methods to nest students within schools, then simultaneously apply the contribution of school variables to their identification with MR, ED, and LD. The process of identification to date has been described as complex, interactive, and contradictory (Skiba et al., 2006), and as more than a disability prevalence quandary (Artiles & Bal, 2008). We concur. Bronfenbrenner's theory suggests the importance of looking beyond the microsystem to unravel this complexity. We have done this, going beyond individual social address characteristics to consider the multiple layers of the school context.

Clearly, there is a long literature and history of minority students being overrepresented in special education. We do not disagree; rather, we are looking beyond the microsystem to explore what other factors may be responsible for the phenomenon of minority student identification in special education: factors that can be changed. Schools are clearly poised to serve as a source of either risk or resilience for minority children and youth, improving the quality of education and reducing the need for special education.

**References**


http://www.rtinetwork.org/learn/diversity/disproportionaterepresentation


OPEN INCLUSION OR SHAMEFUL SECRET: A COMPARISON OF CHARACTERS WITH FETAL ALCOHOL SPECTRUM DISORDERS (FASD) AND CHARACTERS WITH AUTISM SPECTRUM DISORDERS (ASD) IN A NORTH AMERICAN SAMPLE OF BOOKS FOR CHILDREN AND YOUNG ADULTS

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Using a framework of critical literacy, and acknowledging the characteristics of Radical Change, the authors explore 75 North American youth fiction novels which depict characters with disabilities. Books were identified from a variety of sources (i.e., awards lists, book reviews, other research, and word-of-mouth), to represent a random sample that would work within the research timeframe. From the sample, characters who were described as having Fetal Alcohol Spectrum Disorders (FASD) (n=2) or Autism Spectrum Disorders (ASD) (n=14) were analyzed to determine trends and patterns in the character descriptions, settings, and plot lines. There appears to be an underrepresentation of characters with FASD in North American youth fiction in comparison to the representation of characters with ASD, a similar group in society in terms of incidence. An annotated bibliography includes the 15 titles portraying characters with FASD or ASD within the larger sample.

Portrayals of characters with disabilities, in fiction for young people, have been evolving in accordance with characteristics of Radical Change (Dresang, 1999). Radical Change has been affecting textual evolution through diverse forms and formats, changing boundaries, and changing perspectives. New perspectives appear as the subjugated, unheard voices that are emerging in contemporary literature are not related to ethnicity alone but speak out on previously unrecognized aspects of gender, sexual orientation, occupation, socio-economic level, and ability/disability (Dresang, p. 26). Referring specifically to books about characters with disabilities, Dresang (1999) notes that: Collectively these books allow young people to experience a wide variety of mental and physical challenges, to draw conclusions of their own, and to begin to comprehend the diversity that exists among previously marginalized people (p. 135).

Keith’s (2001) research on classic fiction has uncovered past patterns related to books about characters with disabilities, including the trend that characters with disabilities are either ‘cured or killed’ within the course of the story, a tendency that suggests authors have not been able to envision a happy future for someone with special needs. Keith indicates that the lessons readers have been learning from classic fiction include the following common themes: there is nothing positive about being disabled; disability is a punishment for bad behaviour; and, people who have disabilities can never be accepted by society. Keith also notes that between 1920 and 1955, polio and blindness tended to outweigh other disabilities characterized in classic fiction by virtue of their prevalence in society.

Critical literacy, supported by a paradigm of critical theory that addresses individual as well as societal transformation, offers a provocative approach towards curriculum (Brenna, 2010). Critical literacy works well with reader-response theories that address the importance of socio-cultural context with regards to meaning-making (Rosenblatt, 2005). Further research is needed to illuminate classroom resources that include characterizations of various forms of ability in addition to data on classroom structures that support critical literacy. This paper addresses themes found within contemporary North American children’s books portraying characters with Fetal Alcohol Spectrum Disorders (FASD) and
Autism Spectrum Disorders (ASD), setting a discussion of these books within a context that extends the lens to arts and culture as representative of societal understandings and stereotypes. In addition to recommendations for educators, it is important that current studies suggest implications for further research regarding portrayals of disability in literature. The relationship between historical landscapes and their subsequent literary exchange is fertile ground for explorations of work in context. An examination of how changes in societal construction of disability have evolved over time, in relation to various textual forms, is rich with potential. Within the context of critical literacy, consideration of the social importance of an awareness of societal change is also suggested as territory for examination.

**Incidence and Prevalence Rates of FASD and ASD**

As we consider the experiences of people with FASD and ASD in North American society, we turn to definitions of the possible scope of the disorders, in addition to incidence and prevalence rates, as ways of engaging in an understanding of individuals with FASD and ASD. In addition, an identification of incidence rates allows us to explore local landscapes and suggest connections between place and artistic representation.

Autism Spectrum Disorder (ASD) is defined by impairments in social skills, difficulties in communication, and the presence of stereotyped or repetitive behaviours (American Psychiatric Association, 2000). The term ASD includes autism, pervasive developmental disorders (PDD), Rett syndrome, childhood disintegrative disorder, and Asperger’s syndrome. These various autism diagnoses are linked by social and communicative features as well as the presence of abnormally focused interests or activities (Oullette-Kuntz et al, 2006). While a number of studies have attempted to determine prevalence rates of ASD, identification is difficult as diagnosis is based on clinical behavioural observations (Grether, 2006). While a number of studies have attempted to determine prevalence rates of an ASD diagnosis and lack of agreed upon standardized instruments further complicate the issue of determining rates of occurrence (Grether). Despite difficulties obtaining valid diagnostic data, three comprehensive American studies suggest that ASD incidence rates involve 6-7 cases in 1000 births (Grether).

Over the last few decades, ASD’s increasing popularity in diagnosis can be partially attributed to: the inclusion of many varying but similar definitions within the spectrum thus increasing the potential for diagnosis; the addition of diagnostic criteria to the DSM-IV; increased public awareness; increased availability of therapeutic services; and the possibility that rates are actually increasing as a result of environmental factors (Grether, 2006). The increase in diagnoses of autism suggest potential relationships regarding changes in literature, namely that more characters will be developed presenting autism as a distinguishing feature; that an understanding of the nature of autism will be more prevalent in the most contemporary of the titles surveyed; and that aspects of current presentations of ASD in literature will lend themselves to critical literacy discussions in terms of patterns and trends.

Fetal Alcohol Spectrum Disorder (FASD) refers to the range of characteristics and disabilities that can occur from prenatal alcohol exposure (Green, 2007). Fetal alcohol spectrum disorder (FASD) is an umbrella term used to collectively refer to the wide range of effects caused by the consumption of alcohol during pregnancy (Chudley et al., 2005; Ryan, Bonnett, & Gass, 2006; Saskatchewan Learning, 2004). These effects differ in each individual but often include forms of physical, mental, behavioural, and learning disabilities which persist into adulthood and therefore have varying impacts across the lifespan (Chudley et al.). The term FASD is not a diagnostic term but instead refers to the spectrum of disorders that are caused by the maternal consumption of alcohol (Chudley et al.). Three diagnostic categories exist within the umbrella term: fetal alcohol syndrome (FAS), partial fetal alcohol syndrome (partial FAS), and alcohol-related neurodevelopmental disorder (ARND), each category displays its own set of associated characteristics (Chudley et al.).

Prenatal alcohol consumption is known to adversely affect the unborn child, resulting in a gamut of lifelong developmental disabilities and hardships (Connor & Streissguth, 1996). The range of effects caused by prenatal alcohol exposure varies among individuals, but it is generally characterized by primary disabilities in the following areas: executive functioning skills that affect planning and abstract thinking (Connor, Sampon, Bookstein, Barr, & Streissguth, 2000); cognitive capacity (Olson, Feldman, Streissguth, Sampson, & Bookstein, 1998); memory and behaviour (Streissguth, 2007); social skills (McGee, Fryer, Bjorkquist, Mattson, & Riley, 2008); and impulse control (Connor et al., 2000; Streissguth, 2007).
Individuals with FASD also exhibit secondary disabilities, which occur after birth and are direct manifestations of primary disabilities. These can include, but are not limited to, mental health problems, inappropriate sexual behaviours, disrupted school experience, and trouble with the law (Government of Canada, 2007; Saskatchewan Learning, 2004). Secondary difficulties hinder the ability of individuals with FASD to behave in socially acceptable ways, and therefore discourage the successful formation of positive peer relationships (Kelly, Day, & Streissguth, 2000; Thomas, Kelly, Mattson, & Riley, 1998). Since children and adolescents with FASD may not comprehend basic social skills, they are at risk for being socially rejected by peers and developing maladaptive behaviour patterns (McGee, Bjorkquist, Price, Mattson, & Riley, 2009). An outcome of ingrained maladaptive behaviour patterns may be increased involvement in illegal activity, and youth with FASD are presently overrepresented in the juvenile justice systems around the world (Fast, Conry, & Loock, 1999).

Fetal Alcohol Spectrum Disorder not only affects the individual, but also the family, community, and all of society (Saskatchewan Learning, 2004). Parents of children with FASD often struggle with their offsprings’ numerous behaviour problems, and find it extremely challenging to keep their children involved in social activities, as well as collaborate with school personnel (Brown & Bednar, 2004). It is projected that 9 out of every 1,000 Canadian babies are born with FASD each year (Public Health Agency of Canada, 2003) and in high-risk communities (i.e. Aboriginal populations, rural areas, and isolated northern communities) the rates may be as high as one in five (Health Canada, 2001). In terms of the current prevalence of FASD diagnoses, one might expect literary representations in kind, as well as differentiation between FASD as an umbrella term and its related diagnostic features. Patterns and trends within titles portraying characters with FASD could be contextualized within a critical literacy framework, just as we previously discussed the potential for books about characters with ASD to lend themselves to such usage. When examining the North American incidence of ASD (6-7 in 1000) and FASD (9 in 1000), we note the higher proportion of the latter, making it likely that more individuals with FASD will participate in the school system as well as in society. In spite of being a population with a higher incidence rate, there appears to be less research available regarding FASD in comparison to ASD, at least so it would seem from our general literature review.

Interestingly, in our examination of a set of 75 North American novels for young people, few titles appear that include characters with FASD, while many characters appear with ASD traits. We ponder the reasons for this discrepancy, and suggest that further research is required to explore its roots. Has artistic attention been focused on creating characters with ASD (more closely associated with Caucasian, upper-middle class families) rather than FASD (closely associated with vulnerable and marginalized populations)? Could this discrepancy have a market value component? Have particular gifted individuals with ASD—Temple Grandin, among others—offered support for an ideology that purports the positive contributions individuals with ASD may offer society (O’Neil, 2008), while we as a society have yet to publically celebrate the gifts of particular people with FASD? For whatever reasons, society’s attention to FASD is noticeably limited. The following discussion serves to highlight this discrepancy by comparing and contrasting North American children’s novels that portray characters with FASD and ASD.

Method
This study examined a combined sample of 75 North American children’s novels, comprised of 50 works written in Canada and described in a previous study (Brenna, 2010) and 25 works written in the United States. From the Canadian sample of 50 books, we located one book portraying a character with FASD and four books presenting characters identified with autism. Widening the sample to include 25 American novels for young people, we focused on a second book depicting a character where the possibility of FASD is referenced fleetingly, as well as 9 more books offering characters with autism. The basis for our discussion of novels portraying FASD and ASD is thus a sample of 15 books, with a total of 16 characters under scrutiny as one of the books involves a set of twins with autism.

Our book-selection methods involved searching titles from awards’ lists, exploring book reviews where ‘disability’ was a key word, perusing research conducted by other sources (Greenwell, 2003; Prater & Dyches, 2008), and word-of-mouth. We estimate our sample of 75 books to be generally representative of contemporary North American children’s books in the field but certainly not an all-inclusive list. From the sample, characters who were described as having Fetal Alcohol Spectrum Disorders (FASD) (n=2) or Autism Spectrum Disorders (ASD) (n=14) were analyzed toward considerations of trends and patterns across a number of pertinent categories.
An adaptation of Berg’s (2009) content analysis allowed us to identify elements across this sample of 15 novels, including characterization (age, gender, disability, sexual orientation, ethnicity, self-image, family composition, special gifts), setting, time period, search for a cure, whether the character died in the course of the story, whether the disability is related to the story’s plot, age range of the audience, point of view, format, and time frame of the story. A qualitative lens offered the opportunity to complete content analysis charts through which to consider patterns and trends in the collected data, and allowed us to observe the themes at work within this study sample of texts. While interesting patterns emerged, it is important to note that these observations must be contextualized within the study sample, and are not necessarily a predictor of all books in the field.

Findings

Our sample suggests that there are many more books depicting ASD than there are books depicting FASD. While 13 books represented characters with ASD within the sample of 75 North American titles, including three American titles where the references to autism are merely implicit, only two titles emerged that portray characters with FASD, and in the one American title included in this total, the references to FASD are fleeting and tentative. In the single American title that alludes to FASD—Gantos’ (2003) *Joey Pigza Swallowed the Key*—the storyline centres on a ten-year-old boy diagnosed with Attention Deficit Hyperactivity Disorder (ADHD). Joey’s mother admits to having consumed alcohol during pregnancy, although she warns Joey not to take the connection any further. The two other novels in Gantos’ series do not even imply FASD and no mention is made within either of them regarding prenatal alcohol consumption by Joey’s mother.

A consideration of audience age provided the following findings. In the Canadian portion of the sample, three titles are for intermediate readers ages 11 and up while two titles are for young adult audiences ages 14 and up. No titles are intended as junior fiction for ages eight and up. In the American portion of the sample, six titles are for intermediate readers and three titles are for young adults with one title for all ages and no titles specifically for junior readers.

The characters with ASD varied across age and gender, but did have some marked similarities. The age range spanned from 5-20. In almost all of the novels, the characters were of nondescript ethnic origin, suggesting a ‘white, middle-class’ background, while one character’s family was briefly described as Greek-Canadian. Both characters with FASD were male, and while 3 characters with autism were female, 11 characters with autism (including a set of twins) were male. This proportion of female characters to male characters in terms of autism correlates with statistics indicating a higher incidence of autism in males (Grether, 2006).

In the American titles, the characters with ASD came from many areas of the United States, but were generally contextualized in small, rural communities. In the Canadian titles, Canadian place names (both rural and urban) were mentioned. Each of the characters in the American texts came from intact, two parent, heterosexual homes, while two of the four Canadian texts dealing with ASD characterized single mothers. The single Canadian text dealing with FASD, as well as the American text dealing with FASD, characterized single mothers, as well. The lone character in the American FASD sample was depicted in a home with multiple and dysfunctional caregivers.

There were also some unique features to the way particular disabilities were addressed among the books in the study sample. In the majority of the American texts, for example, a theme of the books often included the ‘hope for a cure’ to ASD, leading to disappointment when this hope was not realized. This is contrasted by two particular storylines, one where the character with autism was depicted in adulthood, and the other where the character that has autism was depicted as a child detective whose autism helped him solve mysteries. Largely, in the American sample, discussion around a child’s ASD was negative, suggesting that ASD is entirely undesirable, although these text also included a recognition of positive attributes ‘despite’ the ASD. None of the texts in the Canadian sample addressed the idea of a cure. In the Canadian sample, while there were challenges for the characters with ASD, these characters were depicted positively throughout their texts, from first-person and/or third-person perspectives.

In the American texts, Keith’s (2001) suggestion that the lessons readers have been learning from classic fiction in terms of seeing ‘nothing positive about disability’ seems to be upheld on a number of occasions. In the five Canadian texts, however, searching for a ‘cure’ was not part of the storyline, and positive and negative character traits seemed to be relatively balanced. In the North American sample, there appeared
evidence to suggest that contemporary texts contrast with Keith’s (2001) statements about how classic texts depict disability as punishment for bad behaviour, as well as offer pictures of permanent societal rejection. In no case was disability portrayed as something the character ‘deserved’ based on past actions, and the characters were contextualized within communities rather than as social isolates.

Point of view also contributed to the ‘problem’ nature of children with ASD within the American texts. Four characters were primarily described from the perspective of a family member who was troubled by the presence of ASD. Four books came from a third person narrator perspective, and only one was written from the perspective of a character with ASD. All of the personal accounts (both the first-person and the family member’s perspectives) presented frustration with the problem of ASD, while the third person stories tended towards a more strength-based perspective. In the sample of Canadian texts, the ‘problem’ nature of ASD was not the focus of the characterization. Four characters were described from the third person perspective of sibling narrators, and one character related her own story through the use of a first-person journal.

ASD was recognized and named in 10 of the 13 North American books we explored within the sample of 75 books. FASD was only explicitly dealt with in one of the two books we located that discussed or implied FASD, and in the book where FASD was merely implied, it seemed shrouded in secrecy. In the two sequels to this title, there was no further mention of the possibility of FASD, and the boy’s behaviour was simply referred to as ‘attention problems.’ With the grandiose and over the top portrayals of the symptoms of ASD in the American sample, the FASD condition was, in comparison, subdued, hidden, and taboo.

In contrast with the negative depiction of the mother in the single American title that seemed to portray a character with FASD, within the Canadian sample, the home of the lone character with FASD was described in positive terms. Although the character lived with a single mother after his father abandoned the family, the parenting was consistent and caring, and readers have the sense of a stable, if economically disadvantaged, environment for this boy.

Discussion
While ASD and FASD have similar rates of incidence in society, ASD seems more socially acceptable within the context of our sample of 75 novels, both in its actual presence, as well as in the general balance of positive and negative characteristics with which it is depicted. In the American sample, however, characters with ASD tended towards a more negative portrayal, compared to the few books in the Canadian sample. Our rationale for these trends can only be conjecture. Perhaps the suggestion that ASD is perceived as more common in highly educated and middle to upper class homes has led to a more frequent presence of ASD in children’s literature (Grether, 2006). Perhaps a greater movement towards inclusion of children with autism in particular schools has had some effect on more positive portrayals in children’s literature.

In comparison to the greater inclusion of characters with ASD in the children’s novels of our sample, people with FASD seem to be underrepresented in children’s literature. Perhaps there is an intrinsic message within the exclusion of characters with FASD, implying that FASD is preventable and therefore there is a degree of blame and shame associated with it. This blame and shame may prevent authors from wishing to deal with the subject of FASD within children’s and young adult stories. This stigma is not present for characters with ASD, perhaps making them more ‘palatable’ as subject material. Such discrepancy between the inclusion of FASD and ASD in books is unfortunate, as people with FASD need to see their personal issues represented in books just as strongly as any other group, and readers need to experience diversity in texts as this diversity offers the opportunity for ‘windows’ as well as ‘mirrors’ (Galda, 1998).

In the Joey Pigza novels, the sense of embarrassment and shame regarding the allusion to FASD is the most pressing reflection of how FASD may be perceived by the general population. While ASD is prominent in pop culture, FASD is stigmatized, despite the similar prevalence rates. While ASD is becoming a ‘cause’ through celebrity awareness campaigns and charity endeavours, FASD is still the unmentionable and shameful secret that remains hidden. Perhaps this is where the next major trend will need to appear in terms of Radical Change characteristics as unheard voices evolve further into print. Within such an evolution, we expect to see differentiation between characters portrayed with FASD or
ASD, where diversity within each of these marginalized groups may begin to appear more strongly through their depictions in children’s literature.

Our research was conducted to examine patterns and trends in a sample of North American children’s novels portraying characters with disabilities. The main goal of the research was to study and identify appropriate resources for inclusive classrooms through consideration of patterns and trends within this sample of titles and make specific recommendations for further research. The data appears to contain a concerning trend in the underrepresentation of characters with FASD, compared to a greater representation of books with characters who have ASD. Given the interesting lack of correlation between the novels and the incidence and prevalence rates of both ASD and FASD, this trend in the data juxtaposes Autism and FASD as something worth pursuing further in a wider sample.

The most striking trend in our sample of 15 books that included characters with FASD and ASD was the abundance of titles with ASD characters compared to FASD characters. Generally, characters were presented with non-descript ethnic origins. Characters with ASD generally came from stable, two-parent heterosexual homes, while characters with FASD came from single-mother homes. As far as storytelling perspectives, narratives from family members tended to describe the negative characteristics of the disabilities, while third-person narratives tended towards a more strength-based focus. When ASD symptomology was described within the thirteen target novels, it was generally grandiose; within the two target novels concerning FASD, this spectrum disorder was presented subtly, almost secretly. While there was often a search for a cure with ASD, FASD as a condition was unaddressed and even explained away as ‘attention problems.’

The comparison of the number of books about characters with FASD to the number of books about characters with ASD inspired many questions. We wonder whether this trend is worldwide in terms of the underrepresentation of FASD in critical conversation.

FASD is often associated with secrecy and shame, quite possibly due to its preventable nature. We wonder if this shame is the reason for its marginalization in children’s literature, and possibly the reason for a marginalization of people with FASD in general. The trends with the incidence of ASD largely affecting more affluent families, compared to FASD incidence being linked to issues of poverty and addiction, may be an additional reason for this marginalization. Schools have the capacity to inspire change towards social justice through the inclusion of books, stories, and lived experiences of those with FASD. We believe that children with FASD need to be represented in school resources, just as all children benefit from positive role models and an affirmation of personal strengths, resilience, and hope.

Further research is necessary to actively seek out the number of books that depict characters with FASD, in addition to research on societal supports for individuals with FASD in relation to the supports given to individuals with ASD. There needs to be advocacy for delineations of diversity within literature, and such advocacy should highlight the strengths of individuals with FASD (i.e., capacities for caring and emotional responsivity). This sample of novels demonstrates that unlike classic fiction where disabilities were characterized in connection to their prominence in society (Keith, 2001), it appears that incidence and prevalence rates are no longer an important factor in decisions about characterization. Rather, it is the relationship society has with a particular disability, be it either social acceptance or stigma, that seems to be influencing depictions of characters with disabilities.

Encouragement may be needed for authors who write for ages eight to ten, as no junior novels dealing with characters who have FASD or ASD were evident in the sample of books in this study. In addition, considerably more male than female characters with FASD or ASD appeared in the sample, indicating that perhaps gender is playing a role in the characterization of particular spectrum diagnoses. As there is research to suggest that more males than females are currently diagnosed with autism, it appears that the social construction of characters in this regard is evidence based (Grether, 2006).

In terms of supporting inclusive classrooms, a focus on differences rather than a strict focus on deficits is integral for respectful and supportive educational practices. Further research is needed as we compare the treatment of FASD and ASD in socio-cultural artefacts, including children’s fiction, seeking to understand the manner in which disability is defined and affected by social contexts. O’Neill (2008) reminds us that rather than looking for deficits, society should be identifying differences: differences in social interactions, differences in intelligence, differences in communication, and differences in coping.
As research increases regarding FASD in North America, it is predicted that more on this topic will appear in creative and artistic work, including children’s fiction. We hope that further acknowledgements evolve regarding the range of people’s abilities within individual profiles of characters with FASD and ASD. With heightened attention, an increase of community supports can be predicted. The community can then reflect aspects of lived lives currently invisible in North American children’s literature, promoting the respect offered by open inclusion rather than the stigma surrounding shameful secrets.

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Annotated Bibliography of Books for Children and Young Adults

*Books about characters with Fetal Alcohol Spectrum Disorders (FASD):*


*The Moon Children* is a Canadian realistic fiction novel for ages 9 – 12 about a friendship between Billy, a boy with a Fetal Alcohol Spectrum Disorder, and Natasha, an adopted girl from Romania. The story’s setting in North Battleford, Saskatchewan, contextualizes a community talent show where Billy plans to enter his amazing yo-yo routine. He and his dad have practiced the tricks, but his father, an alcoholic, has disappeared and may not return for contest—and Billy’s not convinced he can perform without his dad.


*Joey Pigza Swallowed the Key* is the first novel in a series that follows young Joey Pigza through his struggle to find himself within a turbulent mix of family, school, and personal challenges. The story centers around Joey trying to learn to control his behaviour, while dealing with his mother’s desire to return to his life after leaving him with his grandmother, and his new temporary placement in a special education classroom. Will his mom be able to prove that she is ready to be a parent? Will Joey be able to feel in control of his own body? Can Joey prove that he is *not a bad kid?*

*NB: This book is a first in the Joey Pigza series, which includes What Would Joey Do, and I Am Not Joey Pigza, which were reviewed for this article; however, the first book is the only in the series which eludes to possible FASD.*

*Books about characters with Autism Spectrum Disorders (ASD):*


*The Space Between* is a Canadian realistic fiction novel for young adults. Jace—a grade 12 kid from Halifax—is in Mexico celebrating his 18th birthday when events unfold that are completely unexpected. Instead of losing his virginity, as was his original plan, he develops a perplexing friendship with a guy whom he later discovers is gay, and then watches the girl of his dreams head home to her boyfriend. Exploring what it means to be ‘different,’ Jace is better equipped to understand his elder brother’s suicide and he eventually allows himself the chance to grieve over Stefan’s death. At the same time, Jace values even more deeply his relationship with Luke, his 9 year old brother with autism.


*Anything But Typical* is a realistic fiction novel for young adults told from the perspective of Jason Blake, a 12-year-old boy with Autism. Nothing has ever been easy for Jason, as he struggles to live in a world with *neurotypicals.* However, he has always had a strong connection with words which has resulted in a love of writing. Through this love of writing, Jason develops an online bond with PhoneixBird, another writer who posts stories on the same website. As the bond strengthens Jason begins to feel as though PhoneixBird (Rebecca) could become his first real friend, but he fears she will only see the autism should they meet. Can Jason find the courage to trust Rebecca’s ability to see his true self? Can Rebecca look past Jason’s autism to see the true and genuine friendship that is developing around them? Can Jason find his path in a neurotypical world?

*Wild Orchid* is a Canadian realistic fiction novel for young adults. Taylor Jane Simon, an eighteen-year-old with Asperger’s Syndrome, is reluctantly spending the summer with her mother in Prince Albert National Park. Due to Taylor’s ingenuity and perseverance, the summer has its ups as well as its downs. Taylor gets her first job. She sees her first live theatre—*The Birthday Party*—a unique look at social interaction by Nobel prize winning playwright Harold Pinter. And she addresses a personal goal—acquiring a boyfriend. Readers explore universal themes related to coming-of-age in this first-person account from the perspective of Taylor’s journal.


*The Case of the Nana-napper* is the second novel in the series following Orville Wright and Agatha Wong as they attempt to solve the mystery of Agatha’s Nana’s sudden disappearance. Nana Wong simply would not have left town without letting someone know where she was going, nor would she have left her door open. Agatha’s cunning nature and Orville’s photographic memory and keen eye for detail make this pair perfect for solving the case. Was Nana Wong kidnapped? Who is the strange man in Nana Wong’s photographs? Could he possibly be the kidnapper?


*The Case of the Slippery Soap Star* is the third novel in the series following Orville Wright and Agatha Wong as they attempt to prove false the accusation that Orville’s mother stole the jewellery from the charity fundraiser. Who is the real culprit? Why is famous soap start Trey Beck picking the pockets of his fans? Are the two cases connected?


*The Case of the Trail Mix-up* is the third novel in the series following Orville Wright and Agatha Wong as they attempt to solve the mystery of Stu Frysley’s disappearance. Stu, a school bully who has tormented Orville for years because of his Asperger’s Syndrome, disappeared during a school trip. Everyone is panicking, and the search parties begin the hunt, but something is not quite right to Orville and Agatha. Where has Stu gone? Can our dynamic detectives solve the mystery before it’s too late?


*Al Capone Does My Shirts* is a realistic fiction novel for young adults which follows Moose Flanagan’s struggle to adjust to life on Alcatraz island when his father accepts a position as a prison guard and maintenance man. The family has moved to be closer to the Esther P. Marinoff School in yet another attempt to cure Natalie Flanagan of her very strange behaviour. Moose, on the verge of adolescence, struggles to find himself while balancing his love for his sister, his frustration with being the neglected child, and fitting in at his new home, which just happens to be right next door to the infamous Al Capone during his stay at Alcatraz in 1935.


*Al Capone Shines My Shoes* is the sequel to *Al Capone Does My Shirts* which carries on with the story shortly after Natalie Flanagan has been accepted into the Esther P. Marinoff School. Natalie is making incredible gains in her ability to communicate and attend to other people in the world. There is only one problem—Moose sent a note asking Al Capone to help get Natalie into the school, and now he has received a note saying your turn. Is the note really from Al Capone? Can Moose find away to repay his debt without getting anyone in trouble?


*A Wizard Alone* is the sixth novel in the fantasy fiction series *Young Wizards*. Kit, a young wizard, is tasked to discover why a very gifted wizard in training has gone missing during his Ordeal. Kit quickly discovers that Darryl, the wizard undergoing the Ordeal, has autism and is being viciously tormented by the Lone One. The Lone One has Darryl trapped in his inner world, and does not appear to be willing to quit his attack until he has possessed Darryl. Why is the Lone One after Darryl? How can Kit help to save Darryl without interfering with the Ordeal? Can Darryl survive?


Eleven-year-old Khyber embarks on a desperate search for a friend through first-person narration that illuminates her intelligence and resiliency in an urban Toronto life that looks bleak from the outside but from the inside has a fine balance of edginess, warmth, and adventure. Khyber’s strong, matter-of-fact
voice allows the scenes depicting her relationship with autistic twin brothers and the episodes with X, a homeless person, to operate without sentimentality. One of the main conflicts in the novel is that Khyber’s mother has decided to nominate David and Daniel for a group home, a plan to which Khyber is resistant.


*A Dog Named Christmas* is a young adult fiction novel chronicling the Christmas where Todd McCray, a young man with developmental disabilities reflecting autism, decides to champion the cause of finding homes for dogs who are in the shelter over Christmas. Told from the perspective of his father, a series of flashbacks take the reader through past experiences of hurt, joy, and hope, which explain the family’s reluctance to keep their new found dog.


*Rules* is an intermediate fiction account of 12-year-old Catherine’s experiences living with a brother with autism. In her coming of age account she recounts her desire to make new friends with the neighbour girl next door, being pestered by the boy across the street, being frustrated with her parents, and dealing with her brother David who feels that wearing pants is optional. In order to help her brother learn social norms, she creates a list of rules for David, some serious, others humorous. While at an appointment for her brother, she meets another boy with a disability in the waiting room, and to further complicate things she begins to experience new feelings for this local teen.


Fourteen-year-old Frankie discovers he can dream the future, his only claim to fame, and yet, agonizingly, he cannot prevent disaster. Caught in confusing circumstances, Frankie presents feelings common to young people striving to control unpredictable and unexpected situations. Descriptions of Joey, a kid with autism whom Frankie babysits and eventually chaperones during a riding therapy class, are rendered with care, as are depictions of other characters with special needs who shift in and out of the therapeutic riding context. Through the course of the novel, Frankie explores his fears, including his fear of horses, as well as a developing friendship.
OUR MOVE: USING CHESS TO IMPROVE MATH ACHIEVEMENT FOR STUDENTS WHO RECEIVE SPECIAL EDUCATION SERVICES

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This causal-comparative study evaluated a 30-week chess instructional program implemented within special education math classes for students in the sixth, seventh, and eighth grades in a suburban middle school located in the southwestern United States. An analysis of covariance (ANCOVA) was utilized to compare the adjusted means for the comparison and treatment groups on the students’ math achievement as measured by end-of-year course grades and state assessment scores, the Texas Assessment of Knowledge and Skills (TAKS). Pretest scores and grade levels served as covariates. Results indicated a significant difference on four of the measures in favor of the treatment group: end-of-year course grades, overall TAKS math scale scores, and percentage scores on two specific TAKS math objectives: Numbers, Operations, and Quantitative Reasoning and Probability and Statistics. No significant differences were found between the groups on the other four TAKS math objectives: Patterns, Relationships, and Algebraic Reasoning, Geometry and Spatial Reasoning, Concepts and Uses of Measurement, and Underlying Processes and Mathematical Tools. Causation and generalizability are difficult due to the narrow scope of this study. However, these results are encouraging and suggest chess is a potentially effective instructional tool for students who receive special education services in math.

Students who receive special education services have consistently performed poorly on standardized tests when compared to their non-disabled peers (Barkley, 2007; Deshler, et al. 2004). Indeed, the Center on Education Policy (2009) found the differences in test performance between students with disabilities and their non-disabled peers remains very large. In analyzing state test score trends across the nation from 2006 through 2008, the researchers found that the difference in the percentage of students meeting standards of proficiency often exceeds 30 to 40 percentage points in reading and math. The same holds true in the state of Texas.

According to Texas’s Academic Excellence Indicator System (AEIS), there has been a significant achievement gap in passing rates on the state math assessment, the Texas Assessment of Knowledge and Skills (TAKS), between students who received special education services and the overall population (TEA, 2003, 2004, 2005, 2006, 2007, 2008, 2009a). As Table 1 illustrates, this achievement gap has persisted over the years and widens as the students advance in grade level. For example, from 2003 to 2009 an average of 85.6% of all 3rd graders in Texas passed the math TAKS compared to 79.6% of all 3rd graders receiving special education services (a gap of 6 percentage points), an average of 74.1% of all 7th graders in Texas passed the math TAKS compared to 53.3% of all 7th graders receiving special education services (a gap of 19.4 percentage points), and in the 11th grade this achievement gap rose to 35.4 percentage points (79.4% of all students passed compared with 44.0% of students receiving special education services).
Table 1. Average Percentage of Students Meeting Math TAKS Standards from 2003 to 2009 (English version, First Administration Only)

<table>
<thead>
<tr>
<th>Grade</th>
<th>Overall</th>
<th>SPED</th>
<th>Achievement Gap</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>85.6</td>
<td>79.6</td>
<td>-6.0</td>
</tr>
<tr>
<td>4</td>
<td>86.0</td>
<td>79.0</td>
<td>-7.0</td>
</tr>
<tr>
<td>5</td>
<td>84.0</td>
<td>74.6</td>
<td>-9.4</td>
</tr>
<tr>
<td>6</td>
<td>79.4</td>
<td>61.9</td>
<td>-16.1</td>
</tr>
<tr>
<td>7</td>
<td>74.1</td>
<td>53.3</td>
<td>-19.4</td>
</tr>
<tr>
<td>8</td>
<td>72.0</td>
<td>49.0</td>
<td>-23.0</td>
</tr>
<tr>
<td>9</td>
<td>62.6</td>
<td>32.9</td>
<td>-29.7</td>
</tr>
<tr>
<td>10</td>
<td>65.6</td>
<td>33.6</td>
<td>-32.0</td>
</tr>
<tr>
<td>11</td>
<td>79.4</td>
<td>44.0</td>
<td>-35.4</td>
</tr>
</tbody>
</table>

Given the pressure and ramifications of increased standards and the accompanying high-stakes testing, some special educators and researchers question whether traditional instructional methods for students with learning disabilities are appropriate and adequate (Bottge, Rueda, Kwon, Grant, & LaRoque, 2009). Several gains have been made for these students, but Bottge et al. point out that only a few studies have identified practices that promote effective math instruction for students who receive special education services in inclusive, reform-oriented settings. The researchers emphasized that more research is needed to show how these approaches can be used in addition to or embedded in the general education curricula. Mastropieri et al. (2006) also argued that the type of curriculum employed could play an important role in teaching students with disabilities in special classes and inclusive classes alike. Textbook-based curriculums typically place high demands on students’ language, literacy, and memory skills. Students with learning disabilities and other special needs do not learn easily under this approach. On the other hand, activities-oriented (or inquiry-oriented) approaches minimize language and literacy requirements. Activities-oriented approaches emphasize hands-on experiences and inquiry rather than memory for text and vocabulary information. Through a series of related quantitative, qualitative, and mixed-method studies, Mastropieri, Scruggs, and Magnusen (1999) found that activity-based approaches to science education could produce powerful learning and affective effects for students with disabilities (p. 248). The game of chess can be used as an activity-based approach to enhance learning.

Storey (2000) strongly advocated that educators consider utilizing the game of chess as an instructional strategy for students receiving special education services to reinforce such skills as (a) concentration, (b) problem identification, (c) problem-solving, (d) planning strategies, (e) creativity, and (f) lucid thinking. He noted that students with disabilities are often not strategic learners and found that chess can tangibly demonstrate to students the rewards of study and practice and that chess can be used as a vehicle for teaching students the process of solving a problem. Indeed, Bulgren, Deshler, and Lenz (2007) also pointed out that students who receive special education services often focus on irrelevant or only remotely relevant content rather than on what is truly important. Chess instruction can provide a means of teaching students to focus on what is important in a given situation.

**Chess and Math Education**

As stated by Root (2008), the game of chess is an authentic context for students’ mathematical problem-solving (p. 2). Indeed, mathematics professor David Robitaille (1974) noted that there are numerous mathematical problems associated with the game of chess and with chessboards. Ho (2006) elaborated on the different kinds of mathematical chess puzzles that can be produced and their potential benefits for learning outcomes. He proffered that chess symbols used directly in arithmetic operations can transform simple, one-step questions into abstract and symbolic multi-step questions that require children to analyze the problem and take the necessary steps to understand the concept before coming up with a solution. For example, Ho substituted chess symbols (images representing the pawns and pieces) for numbers in mathematical equations. Since each pawn and chess piece is proscribed a number value, students could solve the equation using the chess symbols to represent different numeric values. Hong and Bart (2007) examined the cognitive effects of chess instruction on students at risk for academic failure. Thirty-eight students, ages 8 to 12, from three elementary schools participated in this study. The schools were located in Seoul, South Korea. Both groups were administered The Test of Nonverbal Intelligence – Third Edition (TONI-3) and The Raven’s Progressive Matrices Test (RPM) as
pre-tests. The experimental group received twelve, 90-minute chess lessons once per week for three months and the control group students attended regular school activities during that time. Each chess lesson included three segments: reviewing, lecturing, and chess playing. These lessons were derived from Pelts and Albert’s Comprehensive Chess Course (as cited in Hong & Bart). At the end of the chess intervention the participants were again given the TONI-3 and the RPM. The experimental group also took a chess quiz developed by the instructor to measure student knowledge of chess pieces and their moves. A repeated measure ANOVA with a 2X2 factorial design was employed to determine whether chess instruction would influence the experimental group’s scores on the TONI-3 and the RPM. The results of this analysis found no significant difference between these two groups on either measure of cognitive abilities.

Following this statistical procedure, a partial correlation analysis was used to explore relationships among pre-test and post-test scores, chess skill ratings, chess quiz scores, and chess practice for participants in the experimental group. This analysis found that the chess skill rating and the TONI-3 post-test score were significantly correlated when controlling for the pre-test score. According to the researchers, this finding suggested that chess skill rating is a key predictor for the improvement of student cognitive skills. Students at risk of academic failure who are at beginning levels of chess competency may be able to improve their cognitive skills and their skills at chess. The researchers note two major limitations with this study that may account for the lack of significance with cognitive effects: (a) the twelve-session instruction period may have been too brief; Bart’s study (as cited in Hong and Bart, 2007) suggested at least one whole academic year and preferably two, if possible, (b) the chess instruction was not developed specifically for students at risk of academic behavior; it was likely that deeper levels of chess knowledge needed to be acquired in order for higher levels of nonverbal intelligence and other cognitive abilities to be attained.

Scholz et al. (2008) focused their study on relatively specific, sequential transfer of chess training to two domains: concentration and basic math skills. Another aim of this study was to evaluate the feasibility of chess lessons in their schools, including the practicality of developed chess-teaching material and for non-chess playing teachers and the chess playing abilities of children after one year of teaching. The purpose of this study was to evaluate the benefit of chess in mathematics lessons for children with learning disabilities. Seven classes at four schools for children with learning disabilities were selected. The study was initiated in seven classes at four such schools in Leipzig, Germany and its surrounding area with third and fourth graders (two classes at each school except for one with only one class). The duration of the chess intervention was one year. In the schools with two classes, one class was randomly selected as the experimental class and the other as the control class. At the school with only one class, it also served as an experimental class. The experimental classes each received one hour of chess lessons per week in place of one hour of mathematics lessons. Participants were given pre-test and post-test measures of calculation abilities and concentration abilities. Fifty-three students participated in both tests and were eligible for analysis for this study: 31 in the experimental group and 22 in the control group. The results of these measures were analyzed by ANCOVA with the pre-test measures and school as covariates. The researchers found that the students who received weekly chess lessons scored significantly higher on the post-test measure for basic math skills such as counting and addition. Regarding the concentration measure, the researchers found no significant difference between the two groups. The results of this study suggested that there was a sequential, low road transfer of chess skills to basic mathematics skills for students with learning disabilities. Additionally, the process of the study went without any problems and proved to be feasible for both the teachers with no prior chess knowledge and the students. The researchers concluded that chess as an element of mathematics lessons for children with learning disabilities could be a valuable learning tool.

Purpose of the Study
The purpose of this study was to explore the use of the game of chess as an intervention for improving math achievement with students who receive special education services. There is a current emphasis for higher math achievement in public education in America overall. Similarly, there is an emphasis for increased math performance with students with learning disabilities and special needs. The game of chess offers an intriguing potential for its use with students who receive special education services. Traditionally viewed as a game for intellects only, this ancient and international game contains many benefits that mirror effective interventions for these students. It is a tactile, activity-oriented endeavor that promotes critical thinking and lends itself to self-directed learning. While much of the accolades of the benefits of chess in education are anecdotal (Lipshultz, 2009; MacEnulty, 2007), there is enough
empirical evidence to support its exploration with high needs populations (Eberhard, 2006; Scholz et al., 2008). This ex-post facto study examined an intervention implemented at a middle school in a suburban district in the southwestern United States. In order to explore the success of this 30-week program a causal comparative design was employed. Despite its limitations, this study does offer some insight, evidence, and fodder for the further exploration of the game of chess as a tool for enhanced math achievement.

**Method of Procedure**

Similar to Scholz et al. (2008), this ex-post-facto study was designed to evaluate the effectiveness of a chess-math intervention implemented in resource math classes at a middle school campus. This study also corresponds to the recommendation of Hong and Bart (2007) as the intervention was implemented on a weekly basis for five of the six grading terms throughout the academic year. The use of chess instruction as a weekly intervention has been found to be successful in past studies (Eberhard, 2006; Rifner, 1992; Scholz et al., Smith & Cage, 2000). To best assess its effects a causal-comparative study was initiated comparing the math achievement of the students in the treatment classes with the math achievement of students from comparable classes.

**Design**

In this causal-comparative design, one middle school implemented chess instruction once per week for 30 weeks to augment the math curriculum known as the Texas Essential Knowledge and Skills (TEKS). Within the same district, the middle school with the closest demographics and characteristics of students was selected as the comparison group. As Schenker and Rumrill (2004) explained, a causal-comparative design is useful for studies examining differences between intact groups not amenable to treatment manipulation.

For this study, the independent variable was chess instruction. The chess instruction consisted of a weekly chess lesson which supplanted the general math lesson for that class period. The chess lessons focused on teaching the rules of the game, strategies, and tactics and were connected to math objectives. The dependent variable was math achievement. The dependent variable was measured by student scores for (a) the end-of-year course grades in resource math in 2008 and 2009, (b) the Math TAKS for 2008 and 2009 (first administrations only), and (c) each of the six Math TAKS objectives for 2008 and 2009 (first administrations only).

The following hypotheses were tested at the alpha = 0.05 levels of significance:

1. There is a significant difference in end-of-year course grades between students in resource math classes who received weekly chess instruction and students in resource math classes who did not receive weekly chess instruction.

2. There is a significant difference in the math TAKS scale scores between students in resource math classes who received weekly chess instruction and students in resource math classes who did not receive weekly chess instruction.

3. There is a significant difference in percentage scores on the six math objectives measured by the math TAKS test between students in resource math classes who received weekly chess instruction and students in resource math classes who did not receive weekly chess instruction.

**Instrumentation**

The dependent variable was measured in three ways: (a) the students’ percentage scores for the end-of-year course grades in resource math, (b) the students’ overall scale scores on the Math TAKS test, and (c) the percentage scores on each of the six objectives on the Math TAKS test. The end-of-year course grades were the final average of the students’ mastery of Independent Education Program (IEP) goals and objectives in resource math for the entire academic year. These percentage scores reflected the students’ mastery of their IEPs, which were based upon the grade level TEKS. According to the school district’s policy, grades for resource classes were determined based upon students’ progress toward mastery of their individualized goals and objectives. Additionally, students’ mastery levels were individualized for each objective. Weekly averages were calculated for each objective. For example, if a student’s IEP stipulated 60% as the mastery criterion for the math objective titled Concepts and Uses of Measurement, then 60 would have been used as the denominator when the teacher calculated grades for this student on this objective. Thus, if this student’s progress for the week on Concepts and Uses of Measurement was 53%, then 53 would have been divided by 60 and the resulting weekly progress grade
for Concepts and Uses of Measurement would have equaled 88. At the end of each grading period, the teacher averaged the grades by objective. The resulting score was reported as the student’s grade for that term. A student could not receive a grade higher than 100.

The Texas Assessment of Knowledge and Skills (TAKS), Texas Assessment of Knowledge and Skills-Accommodated (TAKS-A), Texas Assessment of Knowledge and Skills-Modified (TAKS-M), and Texas Assessment of Knowledge and Skills-Alternate (TAKS-Alt) were standardized assessments given each spring to all students enrolled in public school in Texas from grades 3 to 11 in several subjects. The TAKS was designed to measure students’ mastery of the state-mandated curriculum, the Texas Essential Knowledge and Skills (TEKS), and their ability to apply these defined knowledge and skills at each tested grade level (TEA, 2009b). As defined by TEA, TAKS measures a student’s mastery of the state-mandated curriculum, the TEKS. All eligible Texas public school students are assessed in mathematics in grades 3-10 and exit level (TEA, p. 5).

The TAKS-A was an accommodated version of the TAKS. It was designed for the assessment of students receiving special education services who met participation requirements. It utilized the same test questions without field test items and a format featuring larger font and more white space. Additionally, students were allowed to use more educational accommodations that were part of their IEP (TEA, 2009b). The TAKS-M test was defined by TEA as an alternate assessment based on modified academic achievement standards and is designed to meet the requirements of federal law. TAKS-M is intended for a small number of students receiving special education services who meet participation requirements. Each test covers the same grade-level content as TAKS, but TAKS-M tests have been changed in format (larger font, fewer items per page, etc.) and test design (fewer answer choices, simpler vocabulary and sentence structure, etc.). (p. 5)

For the purpose of this study, the term TAKS applies to all versions of the state assessment. The TAKS-Alt version was not an included instrument in this study. The results for all three versions of the TAKS assessments incorporated within this study are reported utilizing scale scores. For all grade levels and subjects a scale score of 2100 was set as the minimum standard for a student to demonstrate mastery of the TEKS. A scale score of 2400 was the standard for all tests and grade levels for a student’s performance to be considered commended. Additionally, as a requirement of the Student Success Initiative (SSI) all students in the 5th and 8th grades were required to meet the minimum standard on the math TAKS as part of the criteria for promotion to the next grade level. Students who scored below 2100 were mandated to test again. Students were allowed to take the test up to three times in order to meet the standard. For the purpose of this study only scale score results from the student’s first administration of the exam were collected.

The reliability of the TAKS assessments were tested annually with the use of field tests and field test questions imbedded within the assessments. Measurement for internal consistency utilized the Kuder-Richardson 20 and yielded alpha co-efficients ranging from 0.81 to 0.93 (Garcia, 2008). The TEA also took extensive measures to ensure the content validity of each TAKS assessment. The test itself was a criterion-based assessment. For mathematics, the TAKS consisted of word problems with multiple answer choices.

All 16 students in the comparison group took the TAKS-M version of the state assessment in both 2008 and 2009. For the treatment group, 11 students took the TAKS-M version of the state assessment in both 2008 and 2009. Three students took the TAKS version of the state assessment in 2008 and the TAKS-M version in 2009. One student took the TAKS version of the state assessment in 2008 and in 2009.

**Participants**

The Texas Education Agency collects data through the Public Education Information Management System (PEIMS) four times each school year following a schedule established by the PEIMS Data Standards (TEA, n.d.). For the 2008-2009 academic year, fall data include snapshot data that reflect the status of the district on Oct. 31, 2008. These data include budget, staff, [and] organization and student data. (TEA, ¶ 2). In accordance with this standard, this study utilized this date as the date of enrollment for student data included in this study.

Participants of this study consisted of sixth, seventh, and eighth grade students from two middle schools in a suburban school district located in the southwest United States. On both campuses, the classes were
comprised of sixth, seventh, and eighth grade students together. Prior to the study, initial approval was obtained by the participating school district’s institutional review board (IRB); followed by approval from the university’s IRB.

End-of-year course grades and TAKS scores were analyzed from middle school students enrolled in resource math on both the treatment and comparison campuses during the 2008-2009 academic year. Only scores from students enrolled on the TEA snapshot date of October 31, 2008, through the last day of school, June 5, 2009, were examined. The sample size consisted of a total of 31 participants (16 students at the comparison campus and 15 at the treatment campus) in the sixth, seventh, and eighth grades. According to Gall, Gall, and Borg (2007), in causal-comparative and experimental research, there should be at least 15 participants in each group to be compared (p. 176).

Students identified as part of the treatment group were those students enrolled in resource math classes that exposed students to weekly chess instruction on or before October 31, 2008, through the end of the school year June 5, 2009 and who were in attendance for a minimum of 80% of the chess lessons. These students received instruction in the standard math curriculum that was individualized to meet the goals and objectives of each student’s individualized education program (IEP). One day a week for 30 weeks (out of 36 total instructional weeks) these students received chess instruction instead of the standard math curriculum.

The students identified as part of the comparison group were those students enrolled in resource math classes on or before October 31, 2008, through the end of the school year June 5, 2009, at the comparison campus. These students received instruction in the standard math curriculum that was individualized to meet the goals and objectives of each student’s individualized education program (IEP). These students did not receive chess instruction.

A total of 31 students comprised the sample for this causal-comparative study. The comparison group consisted of 16 middle-school students: 6th graders = 2 (13%), 7th graders = 8 (50%), and 8th graders = 6 (38%). The treatment group consisted of 15 middle-school students: 6th graders = 4 (27%), 7th graders = 6 (40%), 8th graders = 5 (33%). Table 2 displays the demographics for the participants by gender, ethnicity, and socio-economic status as well as by the students’ primary disability diagnoses. All 31 students were diagnosed with a disability that qualified them for special education services; six of these students were also diagnosed with a secondary disability.

Regarding the students’ primary disabilities, the comparison group was composed of 4 students (25%) diagnosed as Other Health Impaired, 1 student (6%) diagnosed as Auditory Impaired, and 11 students (69%) diagnosed with a Specific Learning Disability. For the treatment group, 6 students (40%) were diagnosed as Other Health Impaired, 2 students (13%) were diagnosed with an Emotional/Behavioral Disorder, 5 students (33%) were diagnosed with a Specific Learning Disability, and 2 students (13%) were diagnosed with Autism.

Regarding the students’ secondary disabilities, a total of six students in both groups were diagnosed with an additional disability. Two students in the comparison group were diagnosed with a Speech Impairment as a secondary disability. Four students in the treatment group were diagnosed with secondary disabilities: one as Other Health Impaired and three with a Specific Learning Disability.

All 16 students in the comparison group took the TAKS-M version of the state assessment in both 2008 and 2009. For the treatment group, 11 students took the TAKS-M version of the state assessment in both 2008 and 2009. Three students took the TAKS version of the state assessment in 2008 and the TAKS-M version in 2009. One student took the TAKS version of the state assessment in 2008 and in 2009.

**Procedures**

All schools in Texas keep records of students’ progress by grades and on the state assessment tests (e.g., TAKS). In order to provide anonymity for the participants and to comply with the Family Education Rights and Privacy Act (FERPA), the registrar for each campus was responsible for retrieving the student data for the researcher. The researcher trained the campus registrars on the protocols for reporting the data and for coding the students for anonymity. Each student was coded for anonymity by the registrar. The data reported for each coded student listed their end-of-year course grades in resource math for 2008.
and 2009; their overall scale scores on the math TAKS for 2008 and 2009, and their math TAKS percentage scores by objective for 2008 and 2009.

### Table 2. Background of Participants

<table>
<thead>
<tr>
<th></th>
<th>Comparison Group</th>
<th>Treatment Group</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(n=16)</td>
<td>(n=15)</td>
<td>(n=31)</td>
</tr>
<tr>
<td>Female</td>
<td>6 (38%)</td>
<td>5 (33%)</td>
<td>11 (35%)</td>
</tr>
<tr>
<td>Male</td>
<td>10 (63%)</td>
<td>10 (67%)</td>
<td>20 (65%)</td>
</tr>
<tr>
<td>African American</td>
<td>5 (31%)</td>
<td>5 (33%)</td>
<td>10 (32%)</td>
</tr>
<tr>
<td>Hispanic</td>
<td>5 (31%)</td>
<td>4 (27%)</td>
<td>9 (29%)</td>
</tr>
<tr>
<td>White</td>
<td>6 (38%)</td>
<td>6 (40%)</td>
<td>12 (39%)</td>
</tr>
<tr>
<td>Economic Disadvantaged</td>
<td>10 (63%)</td>
<td>6 (40%)</td>
<td>16 (52%)</td>
</tr>
<tr>
<td>Other Health Impaired</td>
<td>4 (25%)</td>
<td>6 (40%)</td>
<td>10 (32%)</td>
</tr>
<tr>
<td>Auditory Impaired</td>
<td>1 (6%)</td>
<td>0 (0%)</td>
<td>1 (3%)</td>
</tr>
<tr>
<td>Emotional/Behavioral Disorder</td>
<td>0 (0%)</td>
<td>2 (13%)</td>
<td>2 (6%)</td>
</tr>
<tr>
<td>Specific Learning Disability</td>
<td>11 (69%)</td>
<td>5 (33%)</td>
<td>16 (52%)</td>
</tr>
<tr>
<td>Autism</td>
<td>0 (0%)</td>
<td>2 (13%)</td>
<td>2 (6%)</td>
</tr>
</tbody>
</table>

On the treatment campus, the resource math classes were taught in two different class periods and consisted of students in the 6th, 7th, and 8th grades. Each student was taught the grade level TEKS in accordance with his or her IEP by a classroom teacher certified in special education and a paraprofessional teaching assistant. The classroom teacher, who was in her 2nd year of education, and the paraprofessional teaching assistant were responsible for teaching the math curriculum and implementing the appropriate accommodations.

During the beginning of the school year, the teacher and the researcher developed lesson plans that both incorporated chess instruction and met the mathematics TEKS outlined in the students’ IEPs. Keeping the Perkins and Salomon’s (1989) principles of low road, sequential transfer at the forefront, the individualized lesson plans were specifically designed to use chess instruction as a tool for transfer. The chess curriculum was derived primarily from Garry Kasparov’s (Khmelnitsky, Khodarkovsky, & Zadorozny, 2006a, 2006b) and David MacEnulty’s (MacEnulty, 2006) chess curriculums. Additionally, lessons and activities were derived from Alexey Root’s works, Science, Math, Checkmate (2008) and Children and Chess (2006). These individualized chess lessons were taught each Friday for 30 weeks during the students’ normal math class periods. The class periods lasted approximately 50 minutes. The teacher began the weekly chess instruction on the first Friday of the second grading term during the 2008-2009 academic year: October 10, 2008. The lessons were taught on each subsequent Friday through the end of the school year, June 5, 2009. During each of these 30 class periods, students were given the option of participating in the chess lesson or a traditional math lesson. As reported by the classroom teacher, all participants opted for the chess lesson each week.

Neither the classroom teacher nor the paraprofessional teaching assistant possessed much prior knowledge of the game of chess; both reported being only vaguely familiar with the game and its rules. Similarly, the students in the treatment classes possessed minimal prior chess knowledge. An informal survey conducted by the math teacher prior to the chess lessons revealed that ten students reported having never played the game before, two students reported having played once or twice in their lives but did not really know the rules, and three students reported having played several times in their lives and were familiar with the basic rules. Thus, the chess lessons were designed to be taught (and learned) without pre-requisite chess knowledge. Indeed, an implicit aim of this study, similar the aim of Scholz et al. (2008) and a need emphasized by Eberhard (2006), was to explore the feasibility of the implementation of the chess instruction by educators and students who were not well versed in the game of chess. The comparison group was comprised of three resource math classes on the campus that most resembled the treatment campus demographically. This school was located 1.7 miles from the treatment campus and also served students in the 6th, 7th, and 8th grades. The classroom teacher and a paraprofessional teaching assistant were responsible for teaching the math curriculum and implementing the appropriate accommodations. These students were taught the mathematics TEKS according to their IEP goals and objectives. The classroom teacher was also in his 2nd year of education. This teacher did
not utilize chess as a pedagogical tool. It should be noted that unlike the treatment campus, this campus had an active chess club. To control for possible confounding variables, the students enrolled in the comparison class who played chess were expunged from the data by the campus registrar.

**Results**

In order to test the hypotheses for this study, an analysis of covariance (ANCOVA) was conducted to compare the adjusted mean scores for each of the three dependent measures. In accordance with Scholz et al. (2008), the students’ grade level and pretest scores served as covariates to control for error variance. In order to reject the null hypotheses and accept the research hypotheses, F ratios were measured at the alpha = 0.05 levels of significance. With data from 31 participants eligible for analysis, the cutoff score for the F distribution was 4.17.

The design of this study measured math achievement with two forms of instrumentation: the end-of-year course grades in resource math and the math TAKS. There were eight measures of student achievement that were analyzed: the students’ end-of-year course grades in their resource math classes, the students’ overall scale scores on the math TAKS, and the students’ percentage scores on each of the six mathematical objectives on the TAKS: (a) Numbers, Operations, and Quantitative Reasoning; (b) Patterns, Relationships, and Algebraic Reasoning; (c) Geometry and Spatial Reasoning; (d) Concepts and Uses of Measurement; (e) Probability and Statistics; (f) Mathematical Processes and Tools. These scores were tested at the alpha = 0.05 levels of significance with a critical $F$ value $(1, 30) = 4.17$. Table 3 highlights adjusted mean scores for 2009 measures of math achievement.

**End-of-Year Course Grades**

The results of this study indicated a significant difference between the end-of-year course grades for students in resource math classes who received weekly chess instruction and students in resource math classes who did not receive weekly chess instruction. Participants’ final grades from the 2007-2008 academic year served as the pre-test measure. Prior to an analysis of covariance, Levene’s Test of Equality of Variances was calculated. Results were not significant ($F = 0.101, p = 0.753$). Thus, the null hypothesis that the error variance of the dependent variable would be equal across groups was accepted; homogeneity across the two groups was assumed. The mean 2008 pre-test scores for the two groups were as follows: the comparison group had a mean final grade of 84.25 (SD = 6.748) and the treatment group 87.53 (SD = 6.379). The 2009 post-test means were 79.94 (SD = 4.582) for the comparison group and 88.73 (SD = 4.891) for the treatment group. Using grade level and pretest measures as covariates, an Analysis of Covariance (ANCOVA) analyzed the adjusted mean scores (comparison = 80.61; treatment = 88.02) for students from the two groups with the alpha = 0.05. Results showed a statistically significant relationship between the independent variable, chess instruction, and the dependent measure, end-of-year course grades ($F = 19.40; p < 0.001$).

In order to test the power of the statistical significance, a partial eta squared was calculated yielding a medium sized effect for the independent variable (partial $\eta^2 = 0.418$).

**Math TAKS Scale Scores**

Significant differences existed between the math TAKS scale scores for students in resource math classes who received weekly chess instruction and students in resource math classes who did not receive weekly chess instruction. Participants’ math TAKS scale scores from the spring of 2008 (first administration only) served as the pre-test measure. Prior to an analysis of covariance, Levene’s Test of Equality of Variances was calculated. Results were not significant ($F = 0.317, p = 0.578$). Thus, homogeneity across the two groups was assumed.

The mean 2008 pre-test scores for the two groups were as follows: the comparison group had a mean scale score of 2097.94 (SD = 119.148) and the treatment group 2126.80 (SD = 152.931). The 2009 post-test means were 2083.75 (SD = 85.106) for the comparison group and 2192.73 (SD = 104.795) for the treatment group. Using grade level and pretest measures as covariates, an Analysis of Covariance (ANCOVA) analyzed the adjusted mean scores (comparison = 2084.75; treatment = 2191.67) for students from the two groups with the alpha = 0.05. Results showed a statistically significant relationship between the independent variable, chess instruction, and the dependent measure, math TAKS scale scores ($F = 9.167; p = 0.005$). In order to test the power of the statistical significance, a partial eta squared was calculated yielding a moderate sized effect for the independent variable (partial $\eta^2 = 0.253$).
Table 3. Adjusted Mean Scores for 2009 Measures of Math Achievement

<table>
<thead>
<tr>
<th>Measure</th>
<th>Comparison</th>
<th>Treatment</th>
<th>$F$</th>
<th>Significance</th>
<th>Partial $\eta^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Final Grade</td>
<td>80.61</td>
<td>88.02</td>
<td>19.398*</td>
<td>p&lt;0.001</td>
<td></td>
</tr>
<tr>
<td>TAKS Scale Score</td>
<td>2084.75</td>
<td>2191.67</td>
<td>9.167*</td>
<td>p=0.005</td>
<td></td>
</tr>
<tr>
<td>TAKS Objective 1</td>
<td>36.39</td>
<td>55.32</td>
<td>7.167*</td>
<td>p=0.012</td>
<td></td>
</tr>
<tr>
<td>TAKS Objective 2</td>
<td>44.56</td>
<td>46.80</td>
<td>0.860</td>
<td>p=0.772</td>
<td>0.086</td>
</tr>
<tr>
<td>TAKS Objective 3</td>
<td>46.94</td>
<td>59.12</td>
<td>2.368</td>
<td>p=0.135</td>
<td>0.081</td>
</tr>
<tr>
<td>TAKS Objective 4</td>
<td>50.82</td>
<td>59.80</td>
<td>1.447</td>
<td>p=0.239</td>
<td>0.051</td>
</tr>
<tr>
<td>TAKS Objective 5</td>
<td>45.71</td>
<td>67.38</td>
<td>7.321*</td>
<td>p=0.012</td>
<td>0.213</td>
</tr>
<tr>
<td>TAKS Objective 6</td>
<td>47.94</td>
<td>63.26</td>
<td>3.990</td>
<td>p=0.056</td>
<td></td>
</tr>
</tbody>
</table>

*indicates significance at p<0.05 levels

Math TAKS Percentage Scores

This study attempted to assess whether significant differences existed between the math TAKS percentage scores by objective for students in resource math classes who received weekly chess instruction and students in resource math classes who did not receive weekly chess instruction. There are six different math objectives measured by the TAKS: (a) Numbers, Operations, and Quantitative Reasoning; (b) Patterns, Relationships, and Algebraic Reasoning; (c) Geometry and Spatial Reasoning; (d) Concepts and Uses of Measurement; (e) Probability and Statistics; (f) Mathematical Processes and Tools. Participants’ math TAKS percentage scores by objective from the spring of 2008 (first administration only) served as the pre-test measure. Each objective score was analyzed as a separate measure.

Objective 1: Numbers, operations, and quantitative reasoning.
Levene’s Test of Equality of Variances was calculated to reveal no significant differences based upon numbers, operations, and quantitative reasoning ($F = 0.280$, p = 0.601). The mean 2008 pre-test scores for the two groups were as follows: the comparison group had a mean percentage score of 50.25 (SD = 17.983) and the treatment group 56.33 (SD = 18.999). The 2009 post-test means were 35.81 (SD = 15.770) for the comparison group and 55.93 (SD = 21.875) for the treatment group. Using grade level and pretest measures as covariates, an Analysis of Covariance (ANCOVA) analyzed the adjusted mean scores (comparison = 55.32; treatment = 36.39) for students from the two groups with the alpha = 0.05. Results showed a statistically significant relationship between the independent variable, chess instruction, and the dependent measure, math TAKS percentage scores on objective 1 ($F = 7.167$; p = 0.012). In order to test the power of the statistical significance, a partial eta squared was calculated yielding a moderate sized effect for the independent variable (partial $\eta^2 = 0.210$).

Objective 2: Patterns, relationships, and algebraic reasoning.
Levene’s Test of Equality of Variances was calculated and revealed no significant differences based upon patterns, relationships, and algebraic reasoning ($F = 0.449$, p = 0.508). The mean 2008 pre-test scores for the two groups were as follows: the comparison group had a mean percentage score of 37.06 (SD = 22.191) and the treatment group 47.87 (SD = 20.525). The 2009 post-test means were 43.94 (SD = 21.650) for the comparison group and 47.47 (SD = 19.500) for the treatment group. Using grade level and pretest measures as covariates, an Analysis of Covariance (ANCOVA) analyzed the adjusted mean scores (comparison = 44.56; treatment = 46.80) for students from the two groups with the alpha = 0.05. Results did not show a statistically significant relationship between the independent variable, chess instruction, and the dependent measure, math TAKS percentage scores on objective 2 ($F = 0.086$; p = 0.772).

Objective 3: Geometry and spatial reasoning.
Levene’s Test of Equality of Variances was calculated, revealing no significant differences based upon geometry and spatial reasoning ($F = 0.267$, p = 0.609). The mean 2008 pre-test scores for the two groups were as follows: the comparison group had a mean percentage score of 49.69 (SD = 27.930) and the treatment group 48.60 (SD = 25.424). The 2009 post-test means were 46.50 (SD = 20.416) for the
comparison group and 59.60 (SD = 22.950) for the treatment group. Using grade level and pretest measures as covariates, an Analysis of Covariance (ANCOVA) analyzed the adjusted mean scores (comparison = 46.94; treatment = 59.12) for students from the two groups with the alpha = 0.05. Results did not show a statistically significant relationship between the independent variable, chess instruction, and the dependent measure, math TAKS percentage scores on objective 3 ($F = 2.368; \ p = 0.135$).

Objective 4: Concepts and uses of measurement.

Prior to an analysis of covariance, Levene’s Test of Equality of Variances was calculated revealing no significant differences based upon concepts and uses of measurement ($F = 0.126, \ p = 0.725$). The mean 2008 pre-test scores for the two groups were as follows: the comparison group had a mean percentage score of 45.25 (SD = 26.279) and the treatment group 46.60 (SD = 26.554). The 2009 post-test means were 51.56 (SD = 19.298) for the comparison group and 59.00 (SD = 22.377) for the treatment group. Using grade level and pretest measures as covariates, an Analysis of Covariance (ANCOVA) analyzed the adjusted mean scores (comparison = 50.82; treatment = 59.80) for students from the two groups with the alpha = 0.05. Results did not show a statistically significant relationship between the independent variable, chess instruction, and the dependent measure, math TAKS percentage scores on objective 4 ($F = 1.447; \ p = 0.239$).

Objective 5: Probability and statistics.

Results for probability and statistics were found not to be significant after calculating Levene’s Test of Equality of Variances ($F = 0.140, \ p = 0.711$). The mean 2008 pre-test scores for the two groups were as follows: the comparison group had a mean percentage score of 54.25 (SD = 26.459) and the treatment group 64.80 (SD = 21.383). The 2009 post-test means were 45.44 (SD = 20.982) for the comparison group and 67.67 (SD = 21.104) for the treatment group. Using grade level and pretest measures as covariates, an Analysis of Covariance (ANCOVA) analyzed the adjusted mean scores (comparison = 45.71; treatment = 67.38) for students from the two groups with the alpha = 0.05. Results showed a statistically significant relationship between the independent variable, chess instruction, and the dependent measure, math TAKS percentage scores on objective 5 ($F = 7.321; \ p = 0.012$). In order to test the power of the statistical significance, a partial eta squared was calculated yielding a moderate sized effect for the independent variable (partial $\eta^2 = 0.213$).

Objective 6: Underlying processes and mathematical tools.

Levene’s Test of Equality of Variances revealed no significant differences ($F = 0.022, \ p = 0.882$) based upon underlying processes and mathematical tools. The mean 2008 pre-test scores for the two groups were as follows: the comparison group had a mean percentage score of 45.50 (SD = 21.282) and the treatment group 60.27 (SD = 27.202). The 2009 post-test means were 48.50 (SD = 19.538) for the comparison group and 62.67 (SD = 19.888) for the treatment group. Using grade level and pretest measures as covariates, an Analysis of Covariance (ANCOVA) analyzed the adjusted mean scores (comparison = 47.94; treatment = 63.26) for students from the two groups with the alpha = 0.05. Results did not show a statistically significant relationship between the independent variable, chess instruction, and the dependent measure, math TAKS percentage scores on objective 6 ($F = 3.990; \ p = 0.056$).

Discussion

The results of this study are predominantly consistent with the research of Eberhard (2006), Ho (2006), Mastropieri et al. (2006), and Scholz et al. (2008) and contribute to the body of knowledge for both the learning needs of students who receive special education services and the use of chess in education in general. This unique study is the first of its kind to study the use of chess with students in special education math classes in the United States. While this causal-comparative design may not speak to causation, it does offer some interesting insight and empirical support to the anecdotal and theoretical assertions of the positive benefits of chess with students in special populations. More research will be needed to further explore this phenomenon and examine it in closer detail.

One point of interest with this study that was similarly acknowledged in Scholz et al. (2008) pertains to the fact that the treatment group, in essence, received less exposure to the general mathematics curriculum (30 instructional days) than the comparison group and yet still was not outperformed on any of the eight measures of math achievement. Indeed, it could be argued that the comparison group held an advantage over the treatment group in that these students received more instructional hours with the traditional mathematics curriculum. Yet, the treatment group still outperformed the comparison group on four of the mathematics achievement measures. While it is difficult to ascertain the precise cause of
these differences given the nature of the design of this study, these findings (similar to Scholz et al.) do, however, suggest that the loss of the regular mathematics lessons could, in the very least, be compensated by the chess lessons. In other words, supplanting one traditional math lesson a week with a chess lesson did not diminish the math achievement of the students in the treatment group. Indeed, it may very well have enhanced their achievement. More research is recommended in this area.

Moreover, an implicit aim of this study, similar the aim of Scholz et al. (2008) and a need emphasized by Eberhard (2006), was to explore the feasibility of the implementation of the chess instruction by educators and students who were not well versed in the game of chess. An informal survey conducted by the math teacher prior to the chess lessons revealed that: ten students reported having never played the game before, two students reported having played once or twice in their lives, but did not really know the rules, and three students reported having played several times in their lives and were familiar with the basic rules. No students reported playing on a regular basis, nor knew all the rules of the game. The teacher and teacher’s aid were also only vaguely familiar with the game and its rules. Nevertheless, the teacher reported that the process of the study went without problems and that the chess lessons proved feasible for both the educators and students alike. Furthermore, the teacher reported that the students found the chess lessons engaging and looked forward to them each week.

Regarding the phenomenon of transfer, these findings are consistent with that of Rifner (1992). One of the central issues to the successful use of chess instruction in schools is that of transferability. Rifner addressed the concern of the transferability of chess skills to other academic and life areas. He cited the evidence from De Groot (1965) and Chi, Glaser, and Rees (1981) that suggested that high-level chess skills are domain specific and not readily transferable. Rifner’s own study emphasized transfer as an explicit goal of chess instruction and implemented the principles articulated by theorists concerned with transfer of training (Perkins and Salomon, 1989). His results suggested that students were able to transfer skills gained from learning chess to a remote transfer task involving poetic analysis and interpretation. The results of his study indicated that, if methods of teaching for transfer are applied, transfer of training can occur in a real-world classroom setting, even for remote-transfer tasks. Scholz et al. (2008) also focused on low road transfer as an explicit goal for their study. Keeping the principles of low road, sequential transfer at the forefront, this present study was specifically designed to use chess instruction as a tool for transfer. This facet of this study differentiates it from other studies that simply explored the relationship of chess knowledge, chess playing, or isolated chess instruction with academic achievement (Benson, 2006; Garcia, 2008; Hong & Bart, 2007; Korenman, Korenman, & Lyutykh, 2009; Smith & Cage, 2000). The present findings likewise support the conclusion that transfer occurred within the treatment group.

While there are significant findings for this study on four measures of math achievement, it is important to note that the scope of this study was narrow, and thus generalizability is limited. Limitations of this study include small sample size and lack of random assignment. Teacher expectancy effects were likewise unable to be controlled. Furthermore, as Gall et al. (2007) have enumerated, it is difficult to establish causality on the basis of collected data when using an analysis of covariance in a causal-comparative study. Additionally, Schenker and Rumrill (2004) stated, causal-comparative studies examine the magnitude of differences between or among groups, but no attempt is made to infer causality within an individual study (p. 117). The results of this study do, indeed, show a significant difference between the two groups on four of the eight measures of math achievement. While it may not be asserted that the chess instruction was a cause of the difference, these results are encouraging and suggest a possible relationship between math achievement and chess instruction. Thus, in accordance with Scholz et al. (2008), Storey (2000), and Wojcio (1995) these researchers conclude that chess as an element of mathematics lessons in classes for students who receive special education services could be a valuable learning tool. Indeed, these results support the further empirical exploration in this realm.

The findings of this study are promising overall. It is recommended that a replication of this study be conducted on a larger scale and with random assignment, if possible. Furthermore, it is recommended to replicate this study at both the elementary and high school levels. Additionally, more research is recommended to explore in detail the underlying factors for the transfer of chess knowledge to mathematical achievement. In addition to these quantitative research recommendations, it is also recommended that qualitative and mixed-method designs explore the affective benefits of chess instruction for students who receive special education services. Further empirical exploration and development of a chess curriculum that is designed for the mathematics classroom is also recommended.
Should more research in this arena provide strong empirical support for chess as an effective instructional tool in math for students who receive special education services, the ramifications would be highly significant for administrators, teachers, and students.

References
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MacEnulty, D. (2007, February). *Chess: Helping the whole child.* Presented at the University of Texas at Dallas Chess Educator of the Year Award ceremony, Richardson, TX.


In most developed countries, research studies that investigate the effects of special education on student outcomes have become conventional practice. However, in developing countries such as the twin-island Republic of Trinidad and Tobago, there are no studies about the progress and outcomes of students and youths with disabilities. This correlational study is the first attempt to use direct assessments of English language arts and mathematics, as well as independent functioning skills assessments, aimed at exploring the academic achievement and employment outcomes of 124 participants with and without disabilities in Tobago. The study also compared the performance outcomes of Tobago participants with disabilities with US datasets to see how they measure up in terms of academic achievement and employment. Quantitative analyses of direct assessments and multiple survey responses highlight the factors that predict outcomes in academic achievement and employment among Tobago participants. Findings indicate that parental involvement and support, instruction, student engagement, and support for and difficulty with school work were significant academic achievement predictors for students with disabilities, whereas there were no significant predictors of academic achievement for students without disabilities. The significant predictors of employment for youths with disabilities were parent expectations, teachers’ levels of education, youths’ school experiences and school program, whereas levels of social interactions with friends, insurance benefits, money skills, types of instruction and types of pre-employment preparation were significant predictors of employment for youths without disabilities. Finally, comparisons with US datasets indicate that Tobago students with disabilities were performing at lower grade levels in academic areas than their US counterparts. Results also found that while Tobago youths with disabilities had fewer employment opportunities than US youths with disabilities, Tobago working youths with disabilities earned higher wages than those youths in the US. These findings highlight the differences between countries in special education practices that present implications for future research on the impact of country policies and programs on outcomes.

Introduction
The United Nations Salamanca Statement and Framework for Action on Special Needs Education (1994) called for access to and quality of education for all students with disabilities to be comparable to that of their non-disabled peers. The Millennium Development Goals (2000) and the Santiago Consensus (2007) reiterated that universal access to and completion of quality primary and secondary education, and opportunities for lifelong learning were equally important goals. The twin-island Republic of Trinidad and Tobago is a member of the United Nations and adopted the UN policies to provide education services to all children, including students with disabilities under its Universal Access to Primary Education (1960) and Universal Secondary Education (2000). Over the years, this developing country with 1.3 million people has been able to establish some access indicators and performance outcomes for its students and youths without disabilities. However, there has been no outcomes data for its population of 27,000 students (to age 19) and over 5,000 youths (20-30 years old) with disabilities (Trinidad & Tobago Census Data, 2000). There is therefore no knowledge about the impact of the country’s educational policies and practices on students with disabilities that can guide research studies to measure outcomes.
Like most countries that understand the importance of providing appropriate education for all children and expend substantial financial resources on the education of children and youth, Trinidad and Tobago is currently in the untenable position where there is no comprehensive system for monitoring and evaluating progress and achievement for students with disabilities. Therefore continuous citation of the lack of research data served as constraints when reporting national outcomes on an international scale (UNESCO, 2010; UNICEF, 2007; Ministry of Education, 2007). Education for All (2000), the United Nations Declaration, specifies that data collection mechanisms for monitoring performance indicators are important components in measuring and reporting educational outcomes for all students, including students with disabilities. Of the ten developing Caribbean countries, Trinidad and Tobago is considered the 5th largest and the 2nd richest (following the Bahamas – GDP-per capita of $21,300) in economic resources with a GDP- per capita of $19,700 (CIA – The World Bank Fact Book, 2007).

The lack of national data on the performance outcomes for students with disabilities raised fundamental questions: What are the achievement outcomes for students with disabilities compared to their peers without disabilities under the country’s Universal Education system? What are the factors that influence their academic outcomes? What percentage of youth with disabilities successfully transition into the workforce? These questions are relevant for all countries that provide educational opportunities for persons with disabilities. These questions present realities that challenge the fundamental provisions for assessing the achievements and outcomes for children and youth with disabilities in Trinidad and Tobago. It becomes more complex when attempting to compare the factors that affect the outcomes in a developing country with those factors affecting outcomes in a developed country when indigenous research studies are lacking.

While the current practice of special education in Trinidad and Tobago responds in part to the United Nations mandates and the national obligation that every child must attend school, there is no evidence that reflects the academic performance outcomes for the students as they move through the education system and into the workforce. There is no evidence about the possible factors that may have contributed to or impeded any successful outcomes for these students. It is clearly understood that access to education does not necessarily translate to achievement, especially in the case of students with special educational needs and, therefore, performance and achievement indicators provide better measures of outcomes that can be viewed objectively on a global level. This lack of disaggregated data on progress and outcomes was also a concern for this and most developing countries by the Convention on the Rights of the Child in its 2006 observation report (United Nations Convention on the Rights of the Child, 2006).

Studies conducted by several developed countries such as the United Kingdom, Canada, and the United States of America have investigated the multiple factors that were relevant and unique to their understanding of the performance outcomes in their respective countries. Research that explores the case of a developing country such as Trinidad and Tobago would benefit the global community by highlighting commonalities and differences in the outcomes of special education. It is known that special educational policies and practices can vary from country to country across the globe based on social, economic, cultural and political perspectives. As such, there may be different factors that influence the performance outcomes of students with disabilities (Artilles & Dyson, 2005; Brown, 2005). While there may be common denominators, such as in the diagnostic criteria and characteristics used for identification of disabilities, the interpretation and implementation of international mandates such as the Salamanca Statement and Framework for Action in Special Needs Education (UNESCO, 1994) may differ (Artilles & Dyson, 2005; Brown, 2005).

Trinidad and Tobago, like many developing countries, currently engage in transferring special education policies and practices from developed nations such as the USA, UK, and Canada, but implement these practices with limited practical knowledge, experience and inadequate infrastructure. This approach may present differences in the factors that may contribute to student outcomes for which no research is available. Therefore, it becomes problematic to discern which factors actually influence the outcomes.

The most definitive research in the area of performance outcomes was commissioned by the United States Department of Education National Center for Special Education Research from which two major longitudinal studies have emerged: The National Longitudinal Transition Studies (NLTS 1987 – 2007) and the Special Education Elementary Longitudinal Studies (SEELS 2002 – 2007). These studies created the national databases that continuously track the performance outcomes of students with disabilities at various transition points and are useful in presenting a national snapshot of how students
with disabilities are faring in the United States (Wagner et al, 1996). The US models for measuring education progress and outcomes are the best and have been carefully revised and replicated over the last 25 years. With the same intention as SEELS and NLTS, this current study was far reaching in terms of the conceptual domains that it addressed. It utilized multiple data collection sources and methods, including interviews, surveys, direct assessments and student records (Wagner et al, 2005; Blackorby et al, 2005). These instruments allowed the researcher to look at the effects of the independent variables of background factors, school factors and student characteristics on the dependent variables of academic achievement and employment and explored how those factors correlated with as well as predicted the outcomes.

This study was the first attempt to carry out any comprehensive research that would highlight the school and later employment outcomes of students and youths with disabilities in the Republic of Trinidad and Tobago, or in any of the developing countries in the UN Caribbean region. This report is an overview of the findings of the study that begins to inform stakeholders of where the developing country is in meeting its special education obligations as part of the United Nations mandate. A specific purpose of this study was to identify the outcomes of students and youth with learning disabilities, speech/language impairments and intellectual disabilities, using the island of Tobago as the pilot and to compare the factors related to those outcomes with similar outcomes in the United States aimed at understanding variations and commonalities between developing and developed countries. The goal is to establish baseline measures that can serve as benchmarks for measuring progress over time as the country moves towards achieving developed nation status in the future.

Method

Setting and Population

Originally a Dutch colony, Tobago was finally ceded to the United Kingdom in 1814 and was united with Trinidad in 1889. The island of Tobago is situated slightly north-east of Trinidad and is 120 square miles. The population is approximately 55,000, and comprises mostly people of African descent, with a small number of East Indians and other foreign nationals of European descent. The study used the two government special education schools and three general education schools on the island for comparisons. The Division of Education, Youth Affairs and Sport of the Tobago House of Assembly is responsible for education on the island and supported the study.

Tobago’s elementary education population in 2002/2003 was 5,597 served in 33 public and private elementary schools. These schools cater to children from age 5 years to 11 years old under the compulsory education provisions of the Universal Primary Education achieved in 1950 in the country of Trinidad and Tobago. Most schools use the co-educational model (Statistical Digest of the Education System, Ministry of Education of Trinidad and Tobago, 2002-2003). The first important transition occurs when students move from elementary to secondary school at age 11-plus. The Tobago secondary school population reported in 2002/2003 was 4,133 under the Universal Secondary Education obtained in 2000, catering to children from age 11-plus to age 18. The national transition rate to secondary schools in 2006 was 93%, representing 94% males and 92% females. Tertiary education in Trinidad and Tobago is not compulsory. However, the Government of Trinidad and Tobago provides incentives to facilitate continuing education and lifelong learning. In the school year ending 2005, 11% of students (10% males; 13% females) transitioned to tertiary education in the country (EFA Global Monitoring Report Statistics, 2009, p336).

Participants

The sample of participants with disabilities used in this study was 79, comprising 51 students with disabilities and 28 youths with disabilities. The comparison groups without disabilities totaled 45 participants, which included 25 students without disabilities and 20 youths without disabilities.

The specific disability categories studied were intellectual disabilities (ID), learning disabilities (LD), and speech and language impairments (SLI). Intellectual disability is defined as significant limitations both in intellectual functioning and in adaptive behavior as expressed in conceptual, social and practical adaptive skills (AAMR Ad Hoc Committee on Terminology and Classification, 2010, p1). Persons with intellectual disabilities have limitations in the ability to function in areas of daily life, such as communication, school activities, self-care and social situations.
Students and youths identified as having learning disabilities were those students who began general elementary education schools but later transferred to special schools because of their inability to master learning goals in the general curriculum at a relative pace with their peers. These students often repeated grades in the general education setting and participated in remedial education with little success. Individuals with speech/language impairments were those persons whose speech was difficult to understand and follow due to severe stuttering and articulation problems and those whose expressive and receptive language skills were inadequate to sustain age-appropriate communication in both oral and written forms.

Further classifications of participants with disabilities included either Students with Disabilities (SwD) or Youths with Disabilities (YwD), based on their age ranges and developmental transition points. Student participants were selected from among current students at the two special schools in Tobago and were identified by both teachers and parents as having the specific disabilities being studied. Youth participants were those youths who previously attended the two special schools from their elementary through their secondary school years and were also identified by teachers and parents for the study. In addition, the researcher reviewed school records and progress report cards to confirm presence of the disabilities.

Students with Disabilities
For the purpose of this study, students with disabilities were defined as those children who were between the ages of 5 years and 18 years and who received their education in the two government special schools. The study participants identified as having only learning disabilities was 6.6% (5), while 43.4% (33) had only intellectual disabilities and 17.1% (13) had speech language impairments. Among the sample of students with learning disabilities, intellectual disabilities, and speech/language disorders, 43.2% (22) were males and 56.8% (29) were females. There were 8 seven-year-olds, 3 nine-year-olds, 2 ten-year-olds, 6 eleven-year-olds, 1 twelve-year-old, 5 thirteen-year-olds, 8 fourteen-year-olds, 2 fifteen-year-olds, 6 sixteen-year-olds, 3 seventeen-year-olds, and 7 eighteen-plus-year-olds, comprising a total of 51 students.

Youths with Disabilities
The students enrolled in post-secondary specialized settings and who previously attended the special elementary schools were classified as youths with disabilities. Among the 28 youths with disabilities, one of them was a fifteen-year-old who dropped out of general education secondary school. In addition, there were 2 seventeen-year-olds, 1 eighteen-year-old, 2 nineteen-year-olds, 3 twenty-year-olds, 3 twenty-one-year-olds, 2 twenty-two-year-olds, 3 twenty-three-year-olds, 1 twenty-four-year-old, 2 twenty-five-year-olds, 1 twenty-six-year-old, 3 twenty-nine-year-olds, and 4 thirty to thirty-four-year-olds. Among the sample, 21.4% (6) had learning disabilities, 60.7% (17) had intellectual disabilities, and 17.9% (5) had speech language impairments. Males with disabilities accounted for 57.1% (16) while females represented 42.9% (12) of the youths with disabilities in this study.

Comparison Groups
Students and Youths without Disabilities
Twenty-five students without disabilities ranging in ages 6 years to 19 years participated in the study. These students were currently attending general elementary and secondary education settings in Tobago. Twenty (20) youths without disabilities were included in the study. Some of the youths recruited for the study were attending or attended tertiary level education settings, while others graduated from secondary schools and were working. The study matched participants by age ranges.

Data Collection and Instrumentation
Information about the achievement and employment outcomes for participants was derived from a variety of sources adopted from the NLTS/SEELS design, and included parent interviews, teacher surveys, youth surveys, student ratings, and direct assessments using the Woodcock Johnson Tests of Achievement in English Language Arts and Mathematics (WJIII, Woodcock, McGrew, & Mather, 2001). The direct assessments in academic areas focused on providing information that would determine whether there were any significant differences in the academic achievement outcomes between students with disabilities in Tobago and students with disabilities in the US. These assessments would also identify any differences in academic achievements among the three disability categories of students in the study: learning disabilities, intellectual disabilities, and speech/language disorders.
Parent/Youth Interviews investigated the school participation and experiences as well as the employment preparation and opportunities for youths. The survey included questions ranging from liking school, getting along with teachers, paying attention, getting work done, and receiving adequate support services, to interviewees’ feelings about their disability, participation in developing their educational goals, their achievements, their plans for pursuing higher education and/or employment, participation in job-related skills training and planning and support for their transitions. Responses from these youth survey questions provided data that were relevant to knowing whether there were differences in post-school expectations and outcomes among youths with learning disabilities, intellectual disabilities and speech/language disorders and their non-disabled peers.

Teachers who provided academic instruction to the students identified in the study and who had direct knowledge of the students they served completed Teacher Surveys. These surveys focused on the instructional practices and curriculum that the teacher used with the student, accommodations or modifications provided to the student, and the teacher’s training and competence in general and special education. The instrument also included a variety of questions regarding the student’s classroom performance, both academic and behavioral, and incorporated questions from the SEELS Language Arts Teacher Survey and the Program Survey instruments, as well as NLTS Teacher Survey for Special Education Teachers.

Finally, the Parent/Guardian Interview Surveys included questions about student characteristics, disability characteristics, school experiences, family interaction and involvement, employment outcomes, functioning skills, household characteristics and parent expectations. The instruments used in this study were the SEELS Parent Interview and the NLTS2 Parent/Youth Survey. Since the sample consisted of both students who were currently attending the two elementary special schools and youths who were out of elementary schools, the SEELS survey instrument was more relevant for students while the NLTS2 was deemed more appropriate for youths.

Data Analysis

The study used quantitative analyses procedures to ensure that no important contributing factors were overlooked. Findings emerging from quantitative data were analyzed using SPSS statistical software to calculate descriptive statistics, compare mean scores on survey questions between groups, and use multiple regression analysis to determine if certain factors correlated with and predicted performance based on the strength of correlations. Data analysis techniques used for this study were adopted from the SEELS analyses procedures to ensure accurate data comparisons between this study and the US national studies. Methods used included frequencies, cross-tabulations, and summary statistics. These tools provided descriptive information in conjunction with standard errors to estimate their degree of precision. Correlation analyses included simple and multiple correlation coefficients for continuous, dichotomous, and ordinal data to allow investigation of relationships among variables in comparison with both statistical standards to show the relative strength of specific relationships across subgroups. The study used multiple regression analyses to identify the linear combination of variables in order to predict and explain any variations in the continuous dependent variables while logistic regression analyses indicated the linear combination of variables to predict and explain variation in any dichotomous dependent variables (Blackorby at al, 2004).

Results

Altogether, the study included 124 participants (N=124), comprising 51 students and 28 youths with disabilities and 25 students and 20 youths without disabilities. The mean age of the student sample was 13.08 with a standard deviation of 3.85, while the mean age for the youth sample was 24.02 with a standard deviation of 4.72. In the student group, 43.4% were students with intellectual disabilities, 17.1% comprised students with speech or language impairments, 6.6% were students with learning disabilities and 32.9% made up a comparative sample of students without disabilities. In the youth category, 35.4% had intellectual disabilities, 10.4% had speech or language impairments, 12.5% had learning disabilities, and the comparison group of youth without disabilities made up the remaining 41.7%. The gender distribution of the student sample was 43.4% males and 56.6% females while the youth sample was 60.4% males and 39.6% females.

Results from parent interviews indicated that 100% of the student-participants lived in a household with a parent. In the student sample (n=76), 27.6% of respondents were single parents, 40.8% were married, 11.8% were in a marriage-like relationship, 11.8% were widowed, 3.9% were divorced and the other
3.9% were separated. Among these households, parents’ level of education ranged from non-high school graduate to having a graduate degree, with the majority of parents being high school graduates: 77.6% - female; 65.8% - male. In terms of employment status of parents, results indicated that 80.3% of female and 86.8% of male parents were working and household annual income reported that 40.8% earned $25,000 or less while 59.2% earned up to $30,000.

Results of the teachers in the student sample revealed that 98.7% had general education credentials while 30.3% had special education credentials. Teacher qualifications ranged from a certified teacher’s diploma (30.3%) to a professional diploma (7.9%). Among students’ teachers, 36.8% had a bachelor’s degree, 11.8% had 1 year of coursework beyond the bachelor’s degree, 13.2% had a master’s degree, and an overall 40.8% reported having received credentials in both general and special education teacher preparation.

For the youth sample (n=48), Youth/Parent (NLTS), results showed that 81.3% of youths were still single, never married; 10.4% were married, and 8.4% were either engaged or in a marriage-like relationship. The marital status of youths’ parents resulted in 14.6% being single, 52.1% were married, 16.7% were in a marriage-like relationship, 6.3% were divorced, 6.3% were separated and 4.2% were widowed. Results revealed that 85.4% of all youths were living with their parents. Youths’ living arrangements ranged from living alone to living with parents and results indicated that 79.3% male and 94.7% female youth were living with parents, while 13.8% male and 5.3% female were living with a spouse, and 6.8% (all male) were either living on a college dorm or alone. Among the youth participants, 100% of youth with speech/language impairments, 83.3% with learning disabilities, and 94.1% with intellectual disabilities when compared to 75.0% of youth with no disabilities were currently still living with parents.

With regard to family education and employment, 83.3% of mothers and 62.5% of fathers graduated from high school and results indicated that high school graduation was the highest level of parents overall academic achievement. The results from the parent/youth surveys indicated that many of the parents had current jobs, with 83.3% of mothers and 100% of fathers in the workforce. Regarding the overall household income, 35.4% of youths’ households reported an annual income of less than $25,000 while 64.6% reported household incomes of over $25,000.

Teacher participants completed in-person surveys for each youth in the study. Results of teacher qualifications indicated that 29.2% had a certified teacher’s diploma, 16.7% had a bachelor’s degree, 22.9% had at least one year of coursework beyond the bachelor’s degree, and 31.3% had a master’s degree. One-half of the teachers of the youth also reported having special education credentials with 45.8% of them indicating that they received additional training to work with students who are considered to be at risk or had disabilities.

Achievement Outcomes

Direct assessments of student and youth participants (N=124) were conducted to identify the differences between participants with disabilities and those without disabilities as a foundation for establishing performance on academic skills across groups since there were no formal test indicator data for students with disabilities in Tobago. The Woodcock Johnson Tests of Achievement (WJ-III) established baseline performance data on school outcomes as reflected through reading and mathematics achievement. To identify performance differences on the direct assessments, Pearson correlations and ANOVAs showed these differences across disabilities for the sub-group categories of students and youths.

The four subtests of the WJ-III were highly correlated with each other (i.e. Pearson correlations ranged from .91 to .96 for students and .88 to .91 for youth) so the scores on each subtest were therefore summed to arrive at the WJ-III total score. The findings indicated that total achievement scores varied significantly across disability categories in both sub-groups (F (2, 73) = 91.63, p<.001); (F (2, 45) = 52.79, p<.001). Post-hoc Tukey test results revealed that students and youths without a disability (M=142.24; M=149.65) scored significantly higher than students and youths with learning disabilities and speech language impairments combined (M=77.80; M=110.18) and students and youths with intellectual disabilities (M= 36.42; M= 60.16, p<.001), thereby validating a given relationship between disability and school outcomes. Post-hoc Tukey results also indicated that youths with learning disabilities and speech language impairments (M=110.18) performed significantly better than students
with intellectual disabilities ($M = 60.16$), also suggesting a known significant relationship between type of disability and school outcomes.

**Comparisons with US Datasets: Academic Achievements in Reading**

The results revealed higher percentages of Tobago students across all disability categories reading at the 4th grade level or below when compared with US students with disabilities. The highest level of reading achievement for students with learning disabilities was at the 10th grade or above for the US while the ceiling for Tobago students with learning disabilities was at the 7th or 8th grade levels. For students with speech language impairments, reading achievements were at the 10th or above grade levels while Tobago was at the 9th grade level. Students with intellectual disabilities in the US reported highest achievements at grades 7th or 8th, while for Tobago, the highest reading achievement was between 5th and 6th grade, indicating that Tobago students with disabilities were lagging behind the US in reading achievement. A similarity between both countries was that students with intellectual disabilities were the poorest reading achievers which affirmed the SEELS findings (see Fig 1.1).

![Fig 1.1 Student Percentages at Grade Level](image)

The comparison trends between the US and Tobago youths with disabilities were somewhat different as illustrated in Fig. 1.2. While Tobago reported higher percentages than the US of lowest levels of reading achievement for youths with learning disabilities (50% vs 29.4%), percentages of youths with speech/language impairments were about same as the US (40%; 39.9%), but the US reported higher percentages (80%) than Tobago (64.7%) at that lowest level for youths with intellectual disabilities. However, the highest level of reading achievement for youths with learning disabilities both in the US and Tobago was at the 11th grade or above with Tobago reporting more achievements (33.3%) at that level than the US (7.7%). The highest grade level achievement for Tobago youths with speech language impairments was between the 9th and 10th grade levels while the US youths achieved at the 11th grade and above. Similarly, highest reading achievement for Tobago youths with intellectual disabilities was found between the 5th or 6th grade levels, while the US youths with intellectual disabilities performed up to the 7th and 8th grade levels. The US results also showed a broader spread of reading achievements across the grade levels.
Comparisons with US Datasets: Academic Achievements in Mathematics

Mathematics achievement reflected similar results when comparing US and Tobago performances. Tobago students reported significantly higher percentages of lowest achievement levels at 4th grade and below across all disability categories (80.0%; 76.9%; 97.0%) compared to the US (31.8%; 23.4%; 85.3%). Results also revealed that highest mathematics achievements in Tobago were between the 5th and 6th grades levels while in the US, students with learning disabilities and speech language impairments achieved up to the 10th grade and above, and students with intellectual disabilities were between the 7th and 8th grade ceiling in mathematics. Tobago students are lagging behind the US in mathematics achievement.

![Fig 1.2 Youth Percentages at Grade Level](image)

Similar patterns emerged for significantly larger numbers of youth with disabilities in Tobago (66.6%; 60.0%; 88.2%) at the lowest levels in mathematics achievement when compared with youth in US (26.3%; 31.7%; 79.8%). However, more Tobago youths with learning disabilities and speech language impairments performed at the highest achievement level in mathematics than US youths with comparable disabilities. Both countries reported a ceiling effect in mathematics achievement at the 7th to 8th grade level for youths with intellectual disabilities.

Given the small sample sizes in the groups in this study and the relatively large number of predictor variables, the first approach was to carry out logistical regression models with the variables that showed significant correlations. Afterwards, step-wise regressions identified the specific relationships between each predictor variable and the outcome it correlated to when all other variables in the regression model were held constant. The predictors that were included in the regression models included parent’s marital status, household income, total number of people in the household, number of children in the household, student experience, parental expectations, instruction, accommodations students received, student engagement in school, characteristics of school program, parental involvement, students’ progress reports, and teachers’ highest level of education. Stepwise regression procedures (one for each dependent measure) determined which of the background and school factors significantly predicted academic achievement. The entry criterion was a p-value of .05 while the exit criterion was a p-value of .10.
Predictors of Academic Achievement

For students with learning disabilities/speech language impairments, the findings indicated that Instruction significantly predicted achievement, as measured by the Woodcock Johnson test ($Beta = .61, p < .001$). Parental involvement also significantly predicted Woodcock Johnson test performance ($Beta = .54, p < .001$). The model indicated that 77% of the variance in the dependent variable was accounted for by the amount of instruction students received and their parents’ involvement. The findings for Students with Intellectual Disabilities indicated that Student Engagement significantly predicted achievement, as measured by the Woodcock Johnson test ($Beta = .44, p < .01$).

Since youth were at different developmental levels than students, other indicators may affect their outcomes. As such, the regression models for the youth sample included the following predictors, namely: youth’s marital status; household characteristics; youth experiences during leisure, participating in school, interacting with friends, handling money, with school, receiving support, getting into trouble, reporting difficulties; youth’s feelings about life, about self, about support and about the future. Other indicators included in this model were instruction youths received, accommodations youths received, their school programs, youth engagement in school, and teacher competencies.

In the case of Youth with Learning Disabilities and Speech Language Impairment, the findings indicated that Support scores positively predicted test performance ($Beta = .25, p < .05$). Student Experiences – Difficulty significantly predicted Woodcock Johnson test performance ($Beta = .25, p < .01$). Student Engagement positively predicted Grade Level ($Beta = .49, p < .05$). For the Youths with Intellectual Disabilities, the regression for the Woodcock Johnson Test of Achievement scores showed that Student Experiences – Support significantly predicted Grade Level achievement ($Beta = .61, p < .01$). Therefore, four key factors significantly predicted academic achievement for students and youths with disabilities, namely parental involvement and support, instruction, student engagement, and support for and difficulty of school work. In other words, the more parents were involved and supported their children’s education, the more instruction students received in school, the more the students were actively engaged in their school work, and the more support they received with difficult tasks, the better were their scores on the academic tests of achievement. There were no significant predictors of academic achievement for students and youth without disabilities.
Employment Outcomes
In Tobago, more youths with intellectual disabilities than those with speech/language impairments and learning disabilities had jobs. One hundred per cent of youths without disabilities had full-time jobs while youths with disabilities worked only part-time. Among the working youth in Tobago, 69% had no disabilities, 14% had intellectual disabilities, 10% had speech language impairments and 7% had learning disabilities.

Of the youth sample (n=48), 29 (60.4%) of them were employed with 62.1% of them earning more than $25,000 per annum. The first employment measure, Hours and Wages consisted of the sum of five survey items, including hours per week, work status, wages per hour, number of years on the job, and monthly income from the job. The findings indicate that Hours and Wages varied significantly across the groups ($F(2,26) = 13.51, p < .001). Post-hoc Tukey test results reveal that this significant difference was due to the following comparisons: Students without a disability ($M = 6501.70$) had significantly greater hours and wages in comparison to students with a learning/speech language impairment ($M = 1079.40$; $p < .01$) and students with an intellectual disability ($M = 856.75$; $p < .001$). Tukey tests revealed no significant differences between the two disability groups.

The second employment measure, Job Experience, consisted of the sum of the Youth’s current job experiences items, including school and community-based work. The results indicate that job experience ratings varied significantly across the groups ($F(2,26) = 5.27, p < .05$). Post-hoc Tukey test results revealed that this significant difference was due only to the following comparison: students without a disability ($M = 14.05$) had significantly lower job experience ratings than students with learning/speech language impairments ($M = 11.20$; $p < .05$).

Employment Comparison with US Datasets
None of the Tobago youths with disabilities worked on a fulltime basis, while significant percentages (50.8% - LD; 57.2% - SLI; and 51.9% - ID) of youths in the US had fulltime employment. Figure 3 showed that although Tobago youths with disabilities were employed at far lower rates than US youths with disabilities, Tobago youths with learning disabilities, speech/language impairments and intellectual disabilities reported earning higher wages (50%; 99.9%; 75% respectively) per hour than US youths with similar disabilities (16.9%; 13%; 8.3%)

![Fig 3. US and Tobago Comparisons- Percentages and Income Ranges by Disability](image-url)
included youths’ instruction and accommodations, their school programs, youths’ engagement in school, and teacher competencies. The summary in Table 1 below shows that the predictors of employment outcomes for youths with disabilities varied when compared to their counterparts without disabilities.

Other Findings: Parent Satisfaction and Expectations
On average, 88% of Tobago parents were very dissatisfied with the special education services their students with disabilities received and 44% were dissatisfied with their academic education. Among parents’ expectations, only 10% expected their children to earn a regular high school diploma, 7% expected that their children would graduate from a 2-year college and there were no parent expectations that any child with a disability will graduate from a 4-year college. However, 41% of parents expected their children will eventually live away from home, 45% expected their youths to get paid jobs, and 34% of parents felt that youths will earn enough to support themselves.

Table 1: Comparisons of Predictors of Employment between Participants with and without Disabilities in Tobago

<table>
<thead>
<tr>
<th>Participants with Disabilities</th>
<th>Participants without Disabilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parent Expectations predicted training scores</td>
<td>Teachers Level of Education and Participants’ School Experiences predicted training scores.</td>
</tr>
<tr>
<td>Parents with higher expectations resulted in higher school training experiences.</td>
<td>Participants with more qualified teachers and general education school experiences reported better pre-employment preparation.</td>
</tr>
<tr>
<td>Teachers’ Level of Education predicted training scores and school- and community-based work experiences</td>
<td>Levels of Social Interaction and Marital Status predicted Hours and Wages.</td>
</tr>
<tr>
<td>Teachers with at least a Bachelor’s degree resulted in higher school training scores and school- and community-based work experiences than participants whose teachers had only a professional or teacher’s diploma.</td>
<td>Having many friends and being married resulted in more working hours and higher wages.</td>
</tr>
<tr>
<td>School Experiences, particularly Interaction with Friends predicted hours and wages</td>
<td>Instruction and Type of pre-employment preparation predicted Job characteristics.</td>
</tr>
<tr>
<td>Participants having more interactions with friends reported working more hours and earning better wages.</td>
<td>Participants who took a technical, vocational, or business class reported more positive job experiences.</td>
</tr>
<tr>
<td>School Program predicted job characteristics as well as hours and wages</td>
<td>Household Characteristics, mainly Insurance Benefits predicted Job Characteristics.</td>
</tr>
<tr>
<td>Participants with a combined program of academic and vocational education reported more positive job characteristics, worked more hours and earned better wages than those who reported only academic or only vocational education preparation</td>
<td>Participants who reported having work-related insurance benefits reported more positive job experiences.</td>
</tr>
</tbody>
</table>

Conclusion
This study on Tobago outcomes for this sample of students and youth with disabilities was the first inquiry to address a need continually cited by the EFA Global Monitoring Reports (2006-2010). These reports indicated that limited knowledge of learning outcomes was a major obstacle that resulted in below level expectations and progress by member countries towards achieving the goals of Education for All (UNESCO, 2010). The results from this first study indicate that Tobago is not yet there in adequately meeting the needs of her citizens with disabilities both in education and in employment, especially when the twin-island Republic has more resources to buttress the program than many other developing countries in the Caribbean region.

Findings in this study responded to important questions about the school and post-school outcomes of students with learning disabilities, speech language impairments and intellectual disabilities in Tobago. This study provides data that are not only relevant to establish a foundation for full-scale research on a national level, but also will contribute to educational reform in the country, as well as add to the body of
literature on educational outcomes for students with disabilities. The results of this study provide a comprehensive overview of the participants’ characteristics in terms of background and school factors and the influences of these factors on academic and employment outcomes. Comparative analyses among disability groups in the US and Tobago as well as between students and youths with and without disabilities in Tobago found significant differences. Multivariate analyses identified several relationships between the independent variables and the outcomes.

In the absence of outcomes data for students with disabilities in Trinidad and Tobago, the first implication of this study was the identification of differences between Tobago (part of a developing country) and the US (a developed nation) as a yardstick for assessing the country’s goal in the direction of acquiring developed nation status. Although not optimal, this comparison helps to contextualize the results of this study as it identifies the factors that account for the differences between the two countries and indicates whether the differences are germane to improving the outcomes for students and youths with disabilities globally. The comparisons made here should be interpreted cautiously, for while the US results can be generalized on a national level, the Tobago results were based only on the Tobago sample of convenience, and not the entire country of Trinidad and Tobago.

To make proximal comparisons between the US and Tobago, data from the most recently published US national outcomes studies were used. The student sample was compared to the SEELS–Wave 3 (2006) outcomes while the youth sample was compared to the NLTS2 – Waves 2 - 4 (2003 – 2009) outcomes studies, where applicable. The results indicated several differences between the educational practices in the US and Tobago, including instructional settings, instructional methods and curriculum that may have influenced the outcomes.

It is important to note that the US practices prior to PL94-142 that mandated free and appropriate public education for students with disabilities in the least restrictive settings, were very similar to current practices in Tobago. The US history of special education moved from institutionalization where persons with disabilities received no formal education but were isolated as a form of protection from the insensitivities of society in residential facilities to being slowly integrated into residential schools, mainly catering to persons with sensory impairments such as blindness and deafness (Winzer, 1986). The early 19th century saw the first attempt to educate students with intellectual disabilities (mental retardation) and other behavioral disorders (Kauffman & Landrum, 2006).

Similarly, the humanitarian sentiments of groups that advocated for more humane treatment and education opportunities for persons with disabilities in the US can be seen as analogous to the Tobago history of disabilities where missionaries and non-governmental organizations stepped in to improve the lives of children with disabilities. Professionals in the fields of medicine, psychology, sociology, social work and education, collectively with parent advocacy groups, played an active role in making the case for special education In the U.S. This collaborative advocacy resulted in landmark legislations that ensure the right to education for, and the removal of the barriers of discrimination of persons with disabilities in the US. Tobago, as well as Trinidad are not yet at this juncture.

A primary difference between the US and Tobago was that students with these disabilities in the US, received academic instruction in a wide variety of settings, including general education inclusion classrooms, resource rooms, and specialized self-contained classrooms. In principle and practice, Tobago students who were identified as having learning disabilities, intellectual disabilities and speech/language impairments received all of their instruction in special schools, which are comparable only to specialized self-contained settings in the US. The US practices today require that students with disabilities be educated to as far an extent as possible with their peers without disabilities. Students in the US with similar disabilities as those participants in the Tobago study were mostly educated in inclusive classrooms. This was a significant difference between the US and Tobago whose shorter history of special education does not yet practice inclusion of students with disabilities in general education settings and does not yet provide opportunities for students with disabilities to experience the full continuum of placement options that are available in the US.

Furthermore, limited exposure to the full general education curriculum raises some concerns based on the differences between the US and Tobago with regard to the instructional practices and curriculum used to educate students with disabilities. In accounting for the influences of instructional practices on academic outcomes, the SEELS (2007) study found that students who received more of their academic
instruction in general education classrooms had higher reading and mathematics scores and read more fluently than students who did not. SEELS also found that students who participated in the general curriculum without modification had more positive results in reading and mathematics abilities than those students who had substantial modifications to the general curriculum (Blackorby, Knokey, Wagner, Levine, Schiller, & Suni, 2007). Based on the results, the lack of exposure to the general education curriculum may then be another factor that influenced the achievements in reading and mathematics for students and youth in Tobago.

Additionally, a lack of formal assessment protocols in Tobago for diagnostic and classification purposes may render some students inappropriately categorized, especially if coexisting conditions could have affected their academic performances. Many students classified with disabilities were generally transferred to special schools after low academic performance and achievement were realized in the general education settings in which they began schooling and not through formal diagnostic procedures. Parents and schools relied on their own observations to establish reasons for performance deficits.

The emphasis on academic performance and the accountability measures, including formal evaluations that are mandated in the US national laws through IDEIA and NCLB policies can account for the extensive use of the general curriculum as a measure of academic achievement for all students, including students with disabilities in the US. While Tobago’s goals for educating students with disabilities may have the same intentions, there are currently no mandated policies and accountability measures that guide the curriculum and instruction, including individualized education plans (IEPs) and assessment through formal testing for its students with disabilities. The findings in this study indicate that teachers in special schools use their knowledge and skills to foster students’ acquisition of reading and mathematics skills, beginning at the most rudimentary level with progress measured by students’ mastery of primarily functional academic skills. This strategy, in fact, does not seem to adequately prepare students to aim towards higher achievement in the general education curriculum, such as secondary and tertiary level education, but instead it arms them with the necessary survival skills. It is little wonder that by the time the students age out of the special schools, most of them are equipped with only basic literacy and numeracy skills, with minimal chances of progressing towards higher education goals.

Overall, US students reported higher grade levels in reading and mathematics than those reflected for Tobago students, signaling that Tobago students are lagging behind the US in basic academic achievements with significantly larger numbers of students performing at the lowest grade levels in Tobago. However, the achievements of the Tobago youth sample were more closely aligned with those of the US, but still reflect significantly higher numbers of lowest achievers than the US, especially for youths with learning disabilities and speech language impairments. It should be noted that while Tobago showed higher percentages of youth proficiency at some grade levels, the US reported a wider spread of achievement across grades. The arguments presented in this manuscript are consistent with earlier findings which reported that several factors often influence outcomes. Both SEELS and NLTS2 suggested that students who received instruction in small groups had both higher grades and higher growth in oral reading fluency than students in larger classes regardless of whether they were in general or special education classrooms (Blackorby et al, 2007). The fact that Tobago students with disabilities received more small-group instruction than US students may therefore account for the Tobago results that showed larger numbers achieving reading and mathematics proficiency at some grade levels.

This study also looked at the differences between student and youth with and without disabilities in Tobago to see whether any of these differences had significant influences on the school and post-school outcomes. As expected and like most prior studies, direct assessment results and grade level analyses of reading and mathematics confirmed the impact of a disability on school outcomes, with students without disabilities performing significantly better than students with disabilities. Among the disability groups, students with learning disabilities and speech language impairments outperformed students with intellectual disabilities (Blackorby et al, 2007, Wagner et al, 2006, 2009).

The implication of these differences in educational practices between the US and Tobago were reflected by the parent responses about their satisfaction with the education their children received and their expectations for their youth later in life. The most important difference between the US and Tobago was the dissatisfaction voiced by Tobago parents about availability of special education services for students in special schools and beyond. Parents’ dissatisfaction with services across disability categories in Tobago were 80% (learning disabilities), 92.3% (speech/language impairments) and 90.8% (intellectual
disabilities) compared to US parents’ dissatisfaction of 27.1%, 13.1%, and 20.2% respectively. These findings come as no surprise since support services for students with disabilities in Tobago are both sparse and inadequate to meet the individual needs of students and youth with disabilities. The US currently has a plethora of support services for individuals with disabilities and is mandated by law to provide these services with the frequency and duration needed to achieve positive outcomes. Tobago, unlike the US, is not yet at this stage where laws and policy mandates are part of the critical infrastructure in the education of students with disabilities. This requires a calculated effort and strong emphasis on special needs as a key objective in the island’s economic planning and delivery agenda. It is the hope that the results of this study will serve as a catalyst in turning the tide on necessary services for students and youth with disabilities in Tobago.

Likewise, results of parent expectations for the future showed significant differences between the US and Tobago. US parents had higher expectations that their youths with learning disabilities (43.7%) and speech language impairments (52.5%) would attend postsecondary schools than do the Tobago parents of these groups of youths with disabilities (16.7%; 20%). The expectations for graduating from either a 2-year or a 4-year college were very dismal for Tobago when compared to the US. Parents in Tobago reported no expectations that their youths across all disability categories will graduate from a 4-year college and only 20% of parents expected their youths with speech impairments to graduate from a 2-year college. Unlike the US, the current lack of provisions to accommodate students with disabilities in either secondary or tertiary educational settings in Trinidad and Tobago can be the reason for parents’ hopeless expectations for higher education opportunities for their children with disabilities. The current options available for most youths with disabilities once they age out of the elementary school system are limited to vocational or technical programs or gaining some form of trade or unskilled employment in Trinidad and Tobago.

Although parents in Tobago had very low expectations for educational achievement for their youths with disabilities, they were more optimistic about their youths’ abilities to get a job, earn enough to support themselves, and eventually be able to live away from home. Even so, parent expectations in the US were still higher than those parents in Tobago, with 89.7% compared to 40% of parents of youth with learning disabilities, 85.5% compared to 60% of parents of youth with speech language impairments and 58.8% compared to 35.3% of youth with intellectual disabilities expected their Tobago youth will eventually get a paid job. Regarding their ability to earn enough to support themselves, US parents also were more positive in their expectations than Tobago parents for youth with learning disabilities and speech language impairments, but Tobago parents of youth with intellectual disabilities (29.4%) were more favorable about the prospects for their youths than US parents (15.5%). These findings shed light on the culture of Tobago with regard to disabilities, a society that is still insensitive to the rights and needs of its citizens with disabilities and their families. It is a culture that still somewhat perceives disability as a family issue that is hidden from the rest of society and therefore there is no real impetus for the country to fulfill its obligations to those who are most vulnerable among us.

Probably, one of the most important findings that signaled a significant difference between the US and Tobago was reflected on the results on employment outcomes for youths with disabilities. While more US youths with learning disabilities, speech language impairments and intellectual disabilities were currently employed (Wagner et al, 2009), working youths with disabilities in Tobago were earning higher wages than working youths with the same disabilities in the US. Only 16.9% of youths with learning disabilities in the US compared to 50% in Tobago were earning $12 or more per hour. Similarly, 13% of US youth with speech language impairment compared to 99.9%, and 8.3% of US youths with intellectual disabilities compared to 75% of Tobago youths were earning more than $12 per hour. This is hopeful, and not unexpected, since Tobago currently has a number of youth empowerment and employment programs centered on extensive national development thrusts that have created industrial employment opportunities and avenues for many of its young people (Tobago House of Assembly, 2008, www.tha.gov.tt).

Nonetheless, consistent with US studies, youths without disabilities fare far better than youths with disabilities in securing more and better paid jobs (Affleck, Edgar, Levine, & Kortering, 1990; Wagner, Blackorby, Cameto, & Newman, 1993; Newman, Wagner, Cameto, & Knokey, 2009). However, it should be noted that most of the youth in the Tobago sample are currently unemployed but are presently attending a government vocational school aimed at preparing them with improved academic and pre-employment skills. This vocational setting was recently established to correct the previous norm of
aging-out students with disabilities from educational settings with no other option but to fend for themselves. How much this preparation translates to actual employment opportunities is unknown at this time.

With regard to employment measures, a significant difference was found between youths with disabilities and youth without disabilities where youths with learning disabilities and speech language impairments reported having more job experiences than youths without disabilities. This may be due in large part to vocational education and apprenticeship opportunities often recommended for youth with disabilities as their only options after school, while youth without disabilities participated less in vocational education and focused more on academics in preparation for higher education pursuits. This was also reflected in the trend reported in US studies and found in this study in which youths with disabilities begin work at significantly younger ages than youths without disabilities (Newman et al, 2009). In spite of their experiences, they still work less hours and have less earning power than youths without disabilities.

While some of the school and background indicators compared with some of the factors associated with outcomes in the US, it is fair to conclude that there were several significant differences between the US and Tobago outcomes results, particularly with regard to demographic indicators, family economics and support, and school programs. It is important to note that, unlike the US studies, relationships between outcomes and demographic variables such as racial/ethnic backgrounds and gender bore no significance for this Tobago study. This is a stark difference between this Tobago study and the US studies, which consistently report significant correlations between outcomes and racial/ethnic demographics (Blackorby et al, 2003; Wagner et al, 2003, 2006; Newman et al, 2009). An explanation for this difference may be that Tobago has one predominant race with very small percentages of other ethnic groups interspersed around the island (Tobago House of Assembly, 2009, www.tha.gov.tt). The study sample itself had insignificant variations in race and therefore did not present the racial/ethnic differences reported in the US studies.

Similarly, most US studies (Frank, Sitlington, Cooper, & Cool, 1990; Scuccimarra & Speech, 1990; Wagner, 1991; Nisbet & Lichtenstein, 1992; Wagner et al, 2003, 2006) found significant gender differences in student and youth outcomes whereas there were no significant associations between gender and outcomes in the Tobago study. Several factors may be responsible for this finding. First, the omission of gender-associated disabilities such as autism, ADHD and emotional disturbances in this study that may have normally increased the ratio of males to females may be one factor. In addition, school programs for students with disabilities in Tobago often exposed all students to the same curricula content that often did not differentiate subject matter based on gender but focused more on developing adequate life-skills among all students.

Household income was another factor cited in the US studies as having some influence on the outcomes for students with disabilities, in that students with higher household incomes scored better on reading and mathematics tests than students from lower-income households, although there were no relationships found between income and grades (Blackorby et al, 2007). In this study, income was not an influential factor. Although many parents of students and youth with disabilities reported lower incomes than those without disabilities, the analyses revealed no significant relationships between income and outcome indicators. A possible reason for this may be because participants in the Tobago study did not vary in racial/ethnic status that frequently emphasizes minority disparities with income as was the case in the US where low household income is often related to minority racial ethnic status (Wagner et al, 2006, Marder et al, 2003).

Overall, the study illuminated some of the educational, economic, social and cultural underpinnings that distinguish the Tobago experience from the US experience for students and youth with disabilities. The major beneficiaries of special education in Tobago – the students and youths and their parents - have expressed their discontent with the services, curriculum, and in some cases, the schools. They have also expressed dismal expectations for post-school success for their students with disabilities. The parents felt that their students and youths with disabilities throughout the country continue to receive education and employment opportunities that are marginal. The problematic issues relate to the lack of social awareness and sensitivity and legitimate inclusive experiences, requiring efficient and adequate early intervention and support services for meeting the individual needs of students with disabilities and their families.
These findings are not new as highlighted in a UNICEF report that summarized the state of Eastern Caribbean countries in meeting the educational needs of students with disabilities as one that lacked specialized services and appropriate and adequate curriculum to maximize educational opportunities (UNICEF, 2007). The specific disadvantages of the Tobago experience calls for a sound infrastructure to promote more optimal academic achievement and employment outcomes for students and youth with disabilities, including laws, mandated policies and adequate funding to support that infrastructure as well as the social commitment to implementing more inclusion opportunities and learning experiences for students and youths with disabilities in society. Notwithstanding that, Tobago is in now in a unique position to use the results of this study to reform its special education system so that all direct stakeholders: parents, teachers and society, but particularly the students and youths with disabilities can realize outcomes that are more successful.

References


PRINCIPALS WHO UNDERSTAND APPLIED BEHAVIOR ANALYSIS PERCEIVE THEY ARE BETTER ABLE TO SUPPORT EDUCATORS WHO TEACH STUDENTS WITH AUTISM

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Local educational agencies are challenged to teach students classified with autism in general education inclusive settings. Findings of empirical studies have reported many educators lacked the necessary pedagogical coursework and training to meet the instructional needs of these students. Building principals have reported they lacked the necessary training, skills, and confidence to evaluate and support teachers who teach students with autism. The purpose of the present paper was to survey 60 elementary school principals, in the Southeastern region of New York, to determine if they perceived they were trained, skilled, and confident in their knowledge of ABA to evaluate and support teachers who worked with students classified with autism in inclusive settings. Nine principals did not participate in this survey. Fifty-one graduate students expedited the interview process and completion of the surveys. The results of the survey supported the hypothesis that principals who understand behavior-analytic strategies grounded in the principles of ABA perceived they were better able to support educators who teach students with autism in inclusive classroom settings.

Introduction
Decades of empirical studies (Centers for Disease Control and Prevention [CDC], 2010) have supported behavior-analytic instructional practices grounded in the principles of applied behavior analysis (ABA) as an effective methodology to teach children classified with autism. Research findings have reported that educators were not adequately trained or skilled to teach these students, especially in inclusive classroom settings (National Research Council [NRC], 2001). Research studies also reported that principals lacked the necessary training, skills, and confidence to evaluate and support teachers who instructed children classified with autism in inclusive settings (Anderson & Decker, 1993; Evans, Bird, Ford, Green, & Bischoff, 1992; Patterson, Bowling, & Marshall, 2000; Praisner, 2003; Reynolds, 2008).

Increase in Autism Diagnosis
Not only have local educational agencies (LEAs) in the United States witnessed a dramatic increase in the number of children classified with autism (CDC, 2009; Rice, 2007), but more students with autism are being educated in general education inclusive classrooms (Goodman & Williams, 2007; U.S. Department of Education, 2006). In fact, since 1997 autism was the only disability group that had more than quintupled in numbers, growing from 42,517 in 1997 to 224,565 in 2006 (U.S. Department of Education, 2007).

For purposes of this survey study autism was defined (by the Individuals with Disabilities Education Improvement Act [IDEA] of 2004) as a developmental disability significantly affecting verbal and non-verbal communication and social interaction, generally evident before age three, that adversely affects a student’s educational performance. Other characteristics often associated with autism are engagement in repetitive activities and stereotyped movements, resistance to environmental change or change in daily routines, and unusual responses to sensory experiences (see U.S. Department of Education, Federal Register (2006) p. 46756, 300.8(c)(1)(i)).
While federal law does not mandate the inclusion of special education students in general education classrooms, the law does require that a considerable attempt be made by LEAs to find an appropriate placement for students with disabilities in the least restrictive environment. For this study the operational definition of inclusion, as defined by Lamar-Dukes and Dukes (2005), was the move toward including students with disabilities in general education…where students with disabilities have sufficient and systematic opportunities to engage with students without disabilities (p. 55).

**Federal Mandates**

In attempting to respond professionally to this unprecedented increase, Federal mandates (IDEA, 2004; No Child Left Behind [NCLB], 2002) have consistently directed State Education Departments and LEAs to address the instructional needs of children classified with autism in the least restrictive environments, namely, inclusive classroom settings. This challenging directive has received support from parents of children with disabilities (Reynolds, 2008), and comes at an extraordinary moment in the history of education since more students with disabilities can be expected to receive their academic instruction in general education environments (Arthaud, Aram, Breck, Doelling, & Bushrow, 2007; Carter & Hughes, 2006; U.S. Department of Education, 2008). Hence, LEAs can be expected to educate a significant number of students diagnosed with autism in general education classes (Goodman & Williams, 2007).

In view of these federal mandates, today’s educators need to be skilled and competent in the use of long-standing effective evidence-based instructional strategies (Dammann & Vaughn, 2001; Harrower & Dunlap, 2001; McCabe, 2008; NRC, 2001; Smith, Robb, West, & Tyler, 2010; Spooner, Dymond, Smith, & Kennedy, 2006), and the fundamentals of positive behavior supports (PBS) (Carr, Dunlap, Horner, Koegel, Turnbull, Sailor, Anderson, et al., 2002). Professional organizations such as The Interstate New Teacher Assessment and Support Consortium [INTASC] (2003), and National Council for Accreditation of Teacher Evaluation [NCATE] (1998), as well as educators and administrators at all levels, agreed that teachers should be prepared to apply the findings of empirical research to the continued enhancement of curriculum and instruction. Thus, Secretary of Education Duncan (2009) urged every teacher education program today to make better outcomes for students the overarching mission that propels all their efforts (p. 3).

**Efficacy of Applied Behavior Analysis**

Not all evidence-based instructional practices are equal; some have been recognized to affect student learning outcomes more than others (CDC, 2010; Forness, Kavale, Blum, & Lloyd, 1997). The use of ABA as an evidence-based instructional approach to teach children with autism has received considerable empirical support. Various evidence-based instructional practices grounded in the principles of ABA (e.g., Discreet Trial Teaching, Pivotal Response Training, the Treatment and Education of Autistic and Related Communication-handicapped Children, Early Intensive Behavioral Intervention, Verbal Behavior Intervention, and others) apply the principles of learning towards the instruction of specific behaviors. As a result, student outcomes are constantly analyzed to establish the functional relationship between the intervention and changes in behavior (Baer, Wolf, & Risley, 1968).

Since the early 1960s an extensive body of empirical data has supported the efficacy of behavior-analytic strategies (Adair & Schneider, 1993; Anglesea, Hoch, & Taylor, 2008; Davis & Chittum, 1994; Eikeseth, Smith, Jahr, & Eldevik, 2002; Hagopian, Brouzek, Bowman, & Jennett, 2007; Heflin & Alaimo, 2007; Lovaas, 1987; Matson, Sevin, Fridley, & Love, 1990; Peyton, Lindauer, & Richman, 2005; Repp, Felce, & Barton, 1988; Sallows & Grauper, 2005; Shinkopf & Siegel, 1998; Smith, Groen, & Wynn, 2000; Taylor, Hughes, Richard, Hoch, & Coelho, 2004; and countless others). Due to this substantial body of empirical evidence, CDC, 2010, the U.S. Surgeon General (Rosenwasser & Axelrod, 2002), and the New York State Department of Health (Clinical Practice Guideline: Report of the Recommendations, 1999) have supported the use of evidence-based instructional practices grounded in the principles of ABA as an important treatment approach for individuals classified with autism.

Therefore, all educators are challenged to learn and master ABA principles and must be trained in the application of these behavior-analytic strategies to appropriately teach children with autism who are placed in inclusive settings. The impact that behavior-analytic instruction can have on a child with autism is profound; in some instances such instruction resulted in children being indistinguishable from their typically developing peers (Lovaas, 1987; Shingkopf & Seigel, 1998). For others, the systematic implementation of these evidence-based instructional strategies resulted in improved outcomes (Browder, Karvonen, Davis, Fallin, & Courtade-Little, 2005).
Yet, NRC (2001) reported, based upon several decades of empirical evidence, that general educators and special educators were not well trained in evidence-based instructional practices grounded in the principles of ABA. Based on these findings, students with autism may have been receiving less than an appropriate level of instruction, and educators may not have been meeting the spirit of NCLB if less than highly qualified educators instructed these children. Hence, LEAs and their respective building principals continued to be faced with a significant challenge to: (a) improve teachers’ understanding of evidence-based instructional practices grounded in the principles of ABA, (b) integrate the application of these practices to pedagogical instruction to better support general and special education teachers who teach children classified with autism, (c) improve teachers’ understanding of PBS, and (d) improve learning outcomes for children classified with autism.

Positive Behavior Support
Positive Behavior Support (PBS) was defined as an applied science that uses educational and systems change methods (environmental redesign) to enhance quality of life and minimize problem behavior (Carr et al., 2002, p. 4). The field of developmental disabilities is to be credited for the origin of PBS which is grounded in the principles of ABA and the normalization/inclusion movement (Carr et al., 2002). PBS effectively integrated ABA concepts such as shaping, fading, chaining, prompting, and reinforcement contingencies to diminish challenging behaviors and has taken on its own uniqueness (Sulzer-Azaroff & Mayer, 1991). According to Chance (1998) and Miltenberger (1997), ABA was responsible for the application of the antecedent-behavior-consequence (reinforcement) model utilized in PBS.

Today, increasing numbers of special education classrooms have utilized PBS as a treatment approach to modify challenging behaviors presented by students with severe disabilities (Heward, 2009). Community environments have become the natural settings to conduct PBS interventions. These natural (or inclusive) settings have enabled educators to modify assessments, interventions, and to target learning outcomes that better meet students’ needs (Carr, 1997).

Carr et al. (2002) reported that Philosophically, PBS subscribes to the principle and ideal of normalization, namely, that people with disabilities should live in the same settings as others and have access to the same opportunities as others (p. 5). Children with autism and other severe disabilities should also receive their academic instruction in general education classrooms alongside their non-disabled peers. Hence, the need for teachers to be well trained and skilled in ABA instructional practices and PBS interventions when working with children classified with autism, especially those in inclusive classroom settings.

Pedagogical Preparation for Principals
While limited empirical studies have been conducted to determine how well prepared building principals are in supporting educators who teach children who are classified with autism in inclusive settings (Salisbury, 2006), principals often expressed a lack of confidence in their pedagogical preparation (Anderson & Decker, 1993; and countless others). Since principals are viewed as both instructional leaders in schools (Fullan, 1991; Hallinger, 2007) and monitors of the implementation of intervention methodologies (Rebore & Walmsley, 2007), their lack of confidence appeared to be an area of concern that needed to be addressed if children who are autistic were to receive an appropriate education in inclusive classroom settings.

In keeping with the spirit of NCLB, building principals have been inclined to evaluate teachers’ professional competence and their successes by examining students’ standardized or achievement scores, and the teachers’ classroom management abilities (Jacobs & Lefgren, 2006). This issue has stressed educators and their immediate supervisors who are now accountable for student outcomes (Hoyle, English, & Steffy, 2002). Hence, if building principals are to effect change in their teachers and improve academic, social, and behavioral outcomes for students with disabilities, they need to have expertise in curriculum, instructional materials and resources, evidence-based intervention practices, methodologies, and strategies (DuFour & Marzano, 2009; Odell, 1986; Pajak, 1989; Salisbury, 2006; Taylor, 1986). To effect this change required a commitment, an increased knowledge base, and training for educational leaders who supported and worked in partnership with their teachers (Guthrie & Schuermann, 2010; Jacobs & Lefgren, 2006; Salisbury, 2006).
Method
This study reviewed and examined the issues pertaining to the pedagogical preparation and confidence level of 51 of 60 selected elementary school building principals from LEAs in the southeastern region of New York. Nine of the 60 principals elected not to participate in this survey. This represented an 85% participation rate. The survey was administered by 51 graduate students who interviewed their respective elementary school principals during school year 2009-2010. The 51 principals who volunteered to participate responded to a questionnaire that contained eight questions. Total anonymity of their participation was assured. Graduate students expedited and facilitated the completion and return of the questionnaires. Previous versions of the instrument were sent to a national jury of experts. Based on feedback from these individuals, certain items were eliminated, and others were revised. The modified survey is indicated in Table 1 and Table 2.

Each of the selected elementary school building principals was asked to respond to the following questions:

(a) In your school, do students classified with autism receive their instruction in inclusive classrooms? Yes___ No___
(b) In your school, who is the primary evaluator of special education teachers working with students classified with autism? Principal___ Special Education Director (SPED)___
(c) In your school, who is the primary evaluator of general education teachers working with students classified with autism? Principal___ SPED___
(d) As an undergraduate or graduate student did you, the building principal, ever take coursework in special education? Yes___ No___
(e) Have you, the building principal, ever taken coursework grounded in the principles of Applied Behavior Analysis (ABA)? Yes___ No___
(f) Are you confident in your pedagogical preparation to evaluate and support special education and general education teachers who teach children classified with autism? Yes___ No___
(g) If the answer to (e) is yes, what coursework or training have you had?
(h) If the answer to (e) is no, what would you recommend, in terms of further training, to be more effective in your supervisory responsibilities of special education and general education teachers who teach children with autism?

It should be noted that principals were not asked if ABA methodologies and PBS interventions were used to educate students with autism in inclusive classrooms. The authors concluded that the principals would have responded to this question based on their own operational definition and understanding of ABA and PBS, and hence provided ambiguous and inconclusive information.

Findings
The responses to survey questions (a) through (f) are presented in Table 1 and a report of the responses to survey questions (g) and (h) were presented in Table 2. The responses appear to support the primary hypothesis that Principals who claim to understand the principles grounded in ABA perceive that they are better able to support educators who teach children classified with autism.

In Table 1, question (a), all 51 principals were asked, if students classified with autism received instruction in inclusive classrooms within their respective elementary schools? Forty-four or 86.3% of the 51 principals responded affirmatively; students with autism, in their respective elementary schools, did receive instruction in inclusive general education classrooms. Seven or 13.7% of the 51 principals reported they had no students classified with autism included in their general education classrooms.

In question (b) the principals were asked who was the primary evaluator of special education teachers who worked with students classified with autism in their schools? Twenty-three or 45.1% of the 51 principals responded that they assumed the primary responsibility of observing, evaluating and supporting special education teachers who worked with students classified with autism. Sixteen or 31.4% of the 51 principals responded that the SPED was the primary evaluator, and twelve or 23.5% of the 51 principals responded that both the principal and the SPED shared equally in the supervision of these teachers. Thirty-five or 68.6% of the building principals reported they assumed, in general, the primary (45.1%) and shared (23.5%) responsibility to evaluate and support special education teachers working with students who were classified with autism in their elementary school buildings.
Table 1. Results of Elementary Schools Principals’ Survey Responses for questions (a) through (f)

<table>
<thead>
<tr>
<th>Questions</th>
<th>Principals Responses (n=51)</th>
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</thead>
<tbody>
<tr>
<td>(a) Do students classified with autism receive instruction in inclusive classrooms?</td>
<td>Yes</td>
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<tr>
<td></td>
<td>44 (86.3%)</td>
</tr>
<tr>
<td>(b) Who is the primary evaluator of special education teachers working with students classified with autism?</td>
<td>23 (45.1%)</td>
</tr>
<tr>
<td>(c) Who is the primary evaluator of general education teachers working with students classified with autism?</td>
<td>51 (100%)</td>
</tr>
<tr>
<td>(d) Did you, the building principal, ever take course work in special education?</td>
<td>46 (90.2%)</td>
</tr>
<tr>
<td>(e) Have you, the building principal, ever taken course work grounded in the principles of ABA?</td>
<td>20 (39.2%)</td>
</tr>
<tr>
<td>(f) Are you, the building principal, confident in your pedagogical preparation to evaluate and support special education and general education teachers who teach children classified with autism?</td>
<td>32 (62.7%)</td>
</tr>
</tbody>
</table>

In question (c) the principals were asked who was the primary evaluator of general education teachers working with students classified with autism? As expected, 51 out of 51 or 100% of the principals responded that they were the primary evaluators and supporters of general education teachers working with students classified with autism in inclusive settings.

The SPED assumed minimal to no responsibility for the supervision of general education teachers working with these children.

In questions (d) and (e) the principals were asked if they had taken coursework in special education as an undergraduate or graduate student, and coursework grounded in the principles of ABA respectively. In response to question (d), 46 or 90.2% of the 51 principals responded that they had taken coursework in special education either in their undergraduate or graduate programs while only five or 9.8% of the 51 principals responded they had not. However, in response to question (e), 20 or 39.2% of the 51 principals responded they had taken coursework grounded in the principles of ABA in college or graduate school while 31 or 60.8% of the 51 principals reported they had not.

Question (f) of the survey study asked principals if they were confident in their pedagogical preparation to evaluate and support teachers who taught children classified with autism. While 32 or 62.7% of the 51 principals responded affirmatively to this question, 19 or 37.3% of the 51 principals responded they were not confident in their pedagogical preparation to properly execute their professional obligations to evaluate and support teachers who taught children classified with autism.

Question (g) asked principals that if they responded yes to question (f) indicating they were confident in their abilities to professionally supervise these educators, what pedagogical preparation and training had they received? The explanations given were as follows: (a) undergraduate or graduate training in special education – 16 responders, (b) in-service training and workshops in special education – 12 responders, (c) support from special education administrative staff – 9 responders, (d) former special education teacher – 6 responders, (e) former special education director – 3 responders, (f) former school psychologist – 2 responders.
Table 2. Results of Elementary Schools Principals’ Survey Responses for questions (g) and (h)

<table>
<thead>
<tr>
<th>Responses</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Undergraduate or Graduate Training in Special Education</td>
<td>16</td>
</tr>
<tr>
<td>In-Service Training and Workshops in Special Education</td>
<td>12</td>
</tr>
<tr>
<td>Support from Special Education Administrative Staff</td>
<td>9</td>
</tr>
<tr>
<td>Former Special Education Teacher</td>
<td>6</td>
</tr>
<tr>
<td>Former Special Education Director</td>
<td>3</td>
</tr>
<tr>
<td>Former School Psychologist</td>
<td>2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Area of Training</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Evidence Based Practices Grounded in the Principles of ABA</td>
<td>12</td>
</tr>
<tr>
<td>Positive Behavior Supports</td>
<td>11</td>
</tr>
<tr>
<td>Support from Special Education Administrative Staff</td>
<td>8</td>
</tr>
<tr>
<td>Observe Model Programs</td>
<td>4</td>
</tr>
<tr>
<td>Special Education Law</td>
<td>2</td>
</tr>
</tbody>
</table>

Table 2 reported the survey’s responses from the 51 principals to questions (g) and (h).

Question (h) asked principals who responded no to question (e), what you would recommend, in terms of further training, to be more effective in your supervisory responsibilities of special education and general education teachers who teach children with autism. Collectively, the 19 principals recommended additional training in the following areas: (a) evidence-based practices grounded in the principles of ABA – 12 responders, (b) PBS interventions – 11 responders, (c) support from special education administrative staff – 8 responders, (d) opportunities to observe model ABA programs – 4 responders, and (e) training in special education law – 2 responders.

Discussion

Responses from the 51 principals who participated in this survey study supported earlier research findings (Goodman & Williams, 2007; U. S. Department of Education, 2006) that reported an increasing number of children classified with autism received their instruction in inclusive classrooms. In fact, 44 or 86.3% of the 51 principals surveyed reported that children who were classified with autism received their instruction in general education inclusive classrooms.

Research findings have reported that special education teachers and general education teachers frequently lacked fundamental training and skills in evidence-based instructional practices grounded in the principles of ABA (CDC, 2010, NRC, 2001, and others), as well as lacking PBS intervention strategies (Carr et al., 2002). Research findings also reported that building principals lacked the necessary training and coursework (Downing & Williams, 1997) to adequately supervise educators who instructed students classified with autism.

The responses in this survey study reported that 23 or 45.1% of the 51 principals (not the SPED) were the primary evaluators and supporters of special education teachers, and 51 or 100% of the 51 principals were the primary evaluators and supporters of general education teachers who taught students classified with autism. While 90.2% (46 of 51) of the principals reported in the survey study they had taken a course in special education, 60.8% (31 of 51) of the principals reported they had not taken any coursework grounded in the principles of ABA. Yet, 32 or 62.7% of the 51 principals perceived they were confident in their pedagogical preparation to evaluate and support teachers who worked with children classified with autism in inclusive classroom settings.
These results vary from earlier studies which reported that principals lacked the necessary training, skills, and confidence to assess and support teachers who taught children classified with autism in inclusive classrooms (Downing & Williams, 1997). Based on the collective responses from 62.7% of the principals who expressed confidence in their ability to evaluate and support staff who worked with these students, several explanations were offered in Table 2 to shed light on this perception of confidence.

Undergraduate and graduate school coursework and training was cited by 50% (16 out of 32) of the principals as the primary reason for their confidence. Twenty of the 32 principals (62.5%) who reported in Table 1 they were confident in their training and skills to evaluate and support staff working with children classified with autism in inclusive classroom settings also reported they had taken coursework grounded in the principles of ABA. Such coursework was taken either at their respective Institution of Higher Education (IHE) or they participated in staff development opportunities (in-service training or workshops pertaining to instructional practices grounded in the principles of ABA) within their LEAs.

The survey results indicated that 31 or 60.8% of the 51 principals reported they had not taken any coursework grounded in the principles of ABA. Nineteen or 61.3% of the 31 principals who had not taken any coursework in ABA reported they lacked confidence in their pedagogical preparation to evaluate and support teachers who worked in inclusive settings with children classified with autism. Hence, the results of this survey study supported the hypothesis that principals who understand interventions grounded in the principles of ABA perceived they are better able to support educators who teach students classified with autism. The results of this study supported earlier research findings which reported the need for all educators to be skilled and competent in the use of long-standing effective evidence-based instructional practices (Dammann & Vaughn, 2001; Harrower & Dunlap, 2001; McCabe, 2008; and others).

Of the principals who perceived and reported they lacked confidence in their pedagogical preparation to evaluate and support staff who worked with students classified with autism, 61.3% reported a need for further training in evidence-based instructional practices grounded in the principles of ABA, and PBS interventions primarily. These principals cited support from their SPED colleagues as well as the opportunity to observe model ABA programs as areas that would enhance their effectiveness in evaluating and supporting their staff.

Limitations of the Survey Study
One limitation of this study was that it was conducted as a survey research study. Therefore, definitive conclusions about the benefits of a principal having knowledge and relevant training in ABA methodologies and practices cannot necessarily be drawn from the collective responses. Secondly, the principals’ responses may have been subjected to inaccurate reporting. Lastly, a third limitation concerned the validity and reliability of the survey instrument. While the instrument was reviewed by a national jury of experts and revised accordingly, it was not validated nor tested for reliability.

Final Thoughts and Implications for Future Research
The dramatic increases in the number of identified students classified with autism, throughout the US and globally continue to be a widespread concern. As we embark on the 21st century, teaching students classified with autism using evidence-based instructional practices grounded in the principles of ABA, as well as PBS interventions, appears to be the hallmark challenge for IHE, LEAs, administrators, educators and parents. Every effort must therefore be made to reform our instructional methods and interventions, as guided by previous and prospective validated empirical findings, to affect positive gains in the (a) cognitive domain, (b) social and behavioral skills domain, and (c) language and communication skills domain of students classified with autism.

These students classified with autism appear to be in need of receiving more than an appropriate education if they are to achieve their maximum potential. They need their teachers and principals to be professionally trained and skilled in evidence-based instructional methods and strategies grounded in the principles of ABA. Although ABA is strongly supported by empirical research, other approaches to instruction should be explored to determine their efficacy in helping children on the autistic spectrum.

Downing and Williams (1997) reported that principals were in need of being trained and skilled in evidence-based practices. In fact, principals have expressed a lack of confidence in their pedagogical preparation to support educators who teach children classified with autism in inclusive classrooms.
(Anderson & Decker, 1993; Evans, Bird, Ford, Green, & Bischoff, 1992; Patterson, Bowling, & Marshall, 2000; Praisner, 2003; Reynolds, 2008). Hence, future empirical studies should examine the direct relationship between the pedagogical preparation of building principals and their level of success (as determined by the outcome data of students’ learning) in supporting educators working with students who are classified with autism in inclusive classrooms.

If building principals continue to be recognized as the educational leader of their respective schools, IHE must examine, adjust, and revise their administrative syllabi to ensure that future school leaders are well trained to make evidence-based decisions pertaining to curriculum and pedagogical instruction for all students (Barnett & Monda-Amaya, 1998; Reynolds, 2008; Salisbury, 2006; Salisbury & McGregor, 2002). Principals should be articulate and knowledgeable about evidence-based instructional practices applicable to all students, especially those classified with autism who receives their instruction in inclusive classrooms.

The writers concluded it is imperative that principals become better prepared to address the educational challenges of working with autistic children. Therefore, principals should be expected to: (a) demonstrate knowledge of content and evidence-based pedagogy, (b) apply findings of empirical research (such as ABA and PBS) to the continued enhancement of curriculum and instruction for students classified with autism, (c) supervise as well as support educators working with students classified with autism in inclusive settings in their elementary schools, and (d) increase students’ standardized test scores.

Finally, it is incumbent upon IHE to collaborate and conduct follow-up surveys with LEAs that have employed the respective institutions’ administrative alumni to determine the level of their efficacy in preparing principals to evaluate and support teachers who teach students classified with autism in inclusive settings. Duncan (2009) noted that Louisiana is the only state following the status and success of its graduates to determine the effectiveness of its teacher preparation programs. Perhaps the same model should be used to track the success of administrative preparation programs and its alumni. Such information would provide colleges and universities with the necessary data to help reform their instructional administrative syllabi, which would improve the preparation and confidence of prospective principals who in turn would better support teachers who teach students classified with autism in inclusive classroom settings.

References


SCHOOL DISASTER PLANNING FOR CHILDREN WITH DISABILITIES
A CRITICAL REVIEW OF THE LITERATURE

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Paul Pagliano
Kim Usher
Brenton Clark

James Cook University, Townsville, QLD, Australia

Human systems have to adapt to climate change and the natural disasters predicted to increase in frequency as a result. These disasters have both direct and indirect health effects. Certain groups, the poor, the elderly, children and those with disabilities are set to be more seriously impacted by disasters because of their greater inherent vulnerability. Adaptation to the health impacts of disasters requires the cooperation and input from all sectors of government and civil society, including schools. This critical literature review examined the body of peer reviewed literature published in English addressing school disaster planning policies with a particular focus on children with disabilities. Results show that children and youth with disabilities are especially vulnerable to disasters. While schools in the U.S. have policies to deal with disasters, these policies are neither comprehensive nor inclusive. The empirical evidence base from which they are developed is severely limited. No publications were identified that represent the current disaster planning of schools in countries like Australia, the UK or Canada. Recommendations for future research are outlined to bridge knowledge gaps and help establish appropriate and inclusive school disaster policies for children with disabilities.

The objective of this paper is to present the results of a critical review of literature published in English about schools’ preparedness to respond to emergency events or disasters arising from climate change. In particular, this review focuses on school preparedness to protect children with disabilities during disasters. The aim of the review was to identify and evaluate the evidence base for school emergency plans and policies. Further, we wish to highlight issues that, when addressed, will promote the safe and equal participation of children and adolescents with disabilities in schools in a context of climate change.

Climate change is predicted to have serious impacts upon Australia (IPCC, 2007). Despite instances of imperfect scientific peer-synthesis by the Intergovernmental Panel on Climate Change (IPCC), the weight of scientific evidence suggests continuing, serious and potentially catastrophic climate change, largely due to human actions. Climate change risk scenarios for the next two decades show a high probability of increased average temperatures, sea level rises and water cycle implications globally. Across Australia these include higher intensity and frequency of weather-related disasters such as floods, cyclones, droughts, heat waves and fires (Commonwealth Scientific and Industrial Research Organisation (CSIRO) & Bureau of Meteorology (BOM), 2007). Recent reviews of climate change science have resulted in bringing forward the predicted timing of such events, making them more imminent (Steffen, 2009). Since climate change and its ramifications are becoming incontrovertible, increased research on its social and cultural dimensions is necessary (Hulme, 2008).
Human health is one of the areas upon which climate change is set to have an important influence. The Intergovernmental Panel on Climate Change (IPCC) Third Assessment Report declared that climate change will increase threats to human health, particularly in lower-income populations, predominantly within tropical and subtropical countries (McMichael et al., 2001). Health impacts might be directly linked to weather and climate variability, they might result from environmental changes that occur in response to climate variability and change, or they could be a consequence of climate-induced economic dislocation and environmental decline (Costello et al., 2009; Ebi, 2008). Direct health impacts can result from thermal extremes and extreme weather events (i.e. floods, heat waves and droughts). Indirect health impacts, likely to have more widespread effects than direct impacts, might occur through changes in the range and intensity of transmission of infectious diseases and food- and waterborne diseases (Costello et al., 2009). Such indirect health impacts can be brought about from ecosystem changes which can facilitate the emergence and re-emergence of disease vectors or pathogens (National Research Council, 2001).

The causal links from climate change to health impacts are complex and include a range of socio-cultural factors such as wealth, status of the public health infrastructure, provision of medical care, as well as health and environmental factors. Pre-existing medical conditions and disabilities, proper nutrition, safe water, and sanitation can all affect health outcomes. The importance of social and community factors in increasing the risk of mortality from weather related events such as heat waves, for example, have been recognised and identified and include social isolation, ethnicity, socioeconomic status, and neighborhood characteristics (Yardley, Sigal & Kenny, 2010). Therefore, the severity of climate change impacts upon health will be determined not only by changes in climate but also by non-climatic factors and by the adaptation measures implemented to reduce negative health impacts.

In the climate change literature *adaptation* is ‘the process of designing, implementing, monitoring, and evaluating strategies, policies, and measures intended to reduce climate change related impacts. In public health the analogous term is considered to be *prevention*’ (Ebi & Semenza, 2008, p. 501). Primary prevention aims to prevent the onset of injury or illness; an example includes the use of bicycle helmets to prevent head injuries. Secondary prevention is designed to diagnose disease early to control its advance, for example by screening for breast cancer. Tertiary prevention occurs once disease is diagnosed in an effort to reduce morbidity and avoid complications. In the context of climate change, the American Public Health Association together with a group of federal, state, and local agencies and partners developed a standards framework in 1994 delineating ten Essential Services of Public Health, (Public Health Functions Steering Committee [PHFSC], 1994). One such proposed service is centred on prevention through enforcing laws and regulations that protect health and ensure safety (Frumkin, Hess, Luber, Malilay, & McGeehin, 2008). In the context of climate change, the role of such a service, or prevention measure, is to ensure that adequate emergency management policies are in place to quickly and effectively respond to climate change induced weather impacts, to ensure that everyone’s safety is maximised in the event of both rapid onset (e.g. cyclone, flood, fire, heat waves, flu pandemic) and slow onset (e.g. vector borne diseases) disaster events. Having adequate emergency management policies in place is critical in community organizations dealing with a large number of individuals who are likely to have a range of vulnerabilities to climate change impacts. Schools are such an organisation.

Schools cater for children who differ from adults in many ways that are of great importance in building public health emergency response plans. Their unique physiology and psychology renders them more vulnerable to health emergencies and disasters (Balbus & Malina, 2009; Chung, Danielson & Shannon, 2008). Children are particularly vulnerable to heat stress, extreme weather events, food and water borne illness and vector borne illness (Balbus & Malina, 2009). Those with mobility and cognitive disabilities may be at particular risk during heat waves and other extreme weather events (EPA, 2006). Compared to adults, children have differences in breathing rate, skin permeability, innate immunity, fluid reserve, communication skills, and poorly developed self-preservation instincts. This range of differences between children and others requires that disaster response plans be tailored to this population. Since children spend as much as 70-80 % of their waking hours away from their parents in school, schools have a responsibility in assuring that children are cared for and proper preparation and interventions are delivered before, during and after a public health emergency (Chung et al., 2008).

**Emergency management policies in schools**

Policies for emergency response to climate change contingencies in schools appear non-existent in Australia, though State Governments do have some related policies. For example, Queensland has
policies in place regarding management of heat waves, building safety, and civil issues (Office of the Queensland Parliamentary Counsel, 2010). Student protection mandates in Queensland outline the responsibilities and commitment of Education Queensland to provide a safe and supportive learning environment, and prevent and respond to harm or risk of harm for all students. Harm in this context is limited to that caused by a school employee, another student, someone outside the state education institution environment, and student self-harm. Another example is school closures, which are an important non-pharmaceutical component of controlling outbreaks of infectious diseases such as pandemic influenza, although little research appears to have been done on the effect of such closures on disease transmission and their educational impact (Berkman, 2008), or even the logistics of their management (Cauchemez et al., 2009).

In the wake of rising confidence about the imminent development of climate change contingencies in the next few decades, Costello et al. (2009) stress that the management of the health effects of climate change requires the cooperation, coordination and input from all sectors of government and civil society, and should engage stakeholders (Ebi & Semenza, 2008). Costello et al. (2009) urge ‘…appropriate public health systems should be put into place to deal with adverse outcomes’ (p.1693). Therefore all schools must have emergency management plans and policies to meet the range of forecasted climate emergencies and to address all students’ needs, including the most vulnerable to climate change impacts, students with disabilities or special healthcare needs. Moreover, schools need appropriate curricula to disseminate information about climate change contingencies to their students and to prepare them for any likely emergency situation.

Children with disabilities
Vulnerable populations, including children with disabilities, are especially at risk in disasters (Balbus & Malina, 2009). The aftermath of Hurricane Katrina highlighted how poorly authorities responded to the needs of the most vulnerable of the community (NMA, 2005). Inadequate emergency planning for children, for example, and the rapid pace of evacuation for Hurricanes Katrina and Rita of 2005, led to over 5,000 children being displaced from their families. A nongovernmental U.S. agency, the National Center for Missing and Exploited Children, had to step in and help reunite families, a process that lasted for 18 months (Chung et al., 2008).

Families caring for a child with a disability are among the most vulnerable since disabilities are strongly associated with social, structural and financial disadvantage (AIHW, 2009). To illustrate the point, one can consider the impact of extreme heat events, predicted to become more prevalent in Australia and other parts of the world. The impact of extreme heat events can be ameliorated through the use of air-conditioning. However, access to air-conditioning is less likely to be found in homes of families with low income (Yardley, Sigal & Kenny, 2010). Such lack of access to air-conditioning might explain findings showing those with disabilities, such as autism or developmental disorders of speech and language—and particularly children—were found to be at highest risk of needing hospitalisation during a heat wave in Australia (Hansen et al., 2008). This risk also holds for individuals with chronic pulmonary, renal and cardiovascular conditions or physical disabilities preventing them from taking care of themselves (Bouchama et al., 2007). Such chronic conditions, commonly encountered in children with physical disabilities (Balbus & Malina, 2009; Werts, Culatta & Tompkins 2007) carry with them the highest mortality risk during heat events (Bouchama et al., 2007).

The social context wherein children with disabilities are often found also adds to their potential vulnerability. In addition to health difficulties inherent with having disabilities and their vulnerability to weather related events, children with disabilities are more likely to experience intra- and extra-familial abuse and neglect (AIHW, 2009), adding to their risk during and in the aftermath of emergency situations. This is thought to be linked to the psychological morbidity found in vulnerable groups like the poor, those with chronic health conditions, women, children and adolescents after the experience of a disaster (Beaton et al., 2009; Somasundaram & van de Put, 2006). For example, adolescents exposed to disasters can experience a range of cognitive problems including loss of concentration and memory, develop learning disorders, somatization, anxiety, depression, acute stress disorder, post-traumatic stress disorder, separation problems, sleep difficulties, aggressiveness, and high-risk health behaviours (Somasundaram & van de Put, 2006) adding to the ongoing care management responsibilities of families who care for a child or adolescent with a disability.
Children with disabilities comprise a considerable number in schools. In 2009 an estimated 168,500 Australian children had severe disability with the proportion of children with severe disability highest among low-income households (29%) and lowest among high-income households (7%) (AIHW, 2009). In the U.S. 8.8% of all children 15 and under have a disability, while 3.6% have a severe disability (Brault, 2008). In the age group 15-24, which incorporates the senior years of schooling the figure climbs to 10.4 % in the U.S. (Brault, 2008).

Purpose of literature review
The purpose of this critical literature review was to examine the body of peer reviewed literature published in the English language addressing school preparedness for dealing with climate change induced contingencies and disaster emergencies. Specifically, we sought to gather evidence to develop a framework for future research designed to increase awareness and guide the development and implementation of inclusive and equitable public health policy for schools. Our particular focus in this literature search was children with disabilities.

Methods
Search Strategy
The literature search was designed to be as broad and as inclusive as possible. Four databases were searched: the United States (U.S.) National Library of Medicine (MedLine) using the OvidSP search engine (Ovid Technologies, New York, NY); the Cumulative Index to Nursing and Allied Health Literature (CINAHL) using the EBSCOhost search engine (EBSCO Publishing, Ipswich, MA); the Education Resources Information Center (ERIC) and PsycINFO, both using the CSA Illumina search engine (ProQuest, Ann Arbor, MI). Four independent search strategies, one tailored for each database, were developed to identify four subsets of articles addressing: (1) policy or planning activities; (2) both natural and human made disasters; (3) schools and other educational institutions; and (4) children with either physical or cognitive/psychological/emotional disabilities.

First, a search strategy was developed for Ovid MedLine. Using the advanced search tools to map search terms to Medical Subject Headings (MeSH) and to view the index hierarchy, a list of MeSH search terms expected to exhaustively cover each of the four subsets of articles was generated. Those terms were then individually entered into CINAHL using the Suggest Subject Terms tool to identify the most appropriate analogous search terms for that database. That process was then repeated for the ERIC database and the PsychINFO database (individually) using the CSA Illumina search engine's thesaurus tool and visual exploration of the index hierarchies for those databases. The final terms incorporated into the four search strategies for each database are shown in Tables 1 - 4.

Search Execution and Article Screening
A similar process was undertaken to screen citations identified by the intersection of any three of the four search terms (Near Match). The titles of these articles were distributed among the study team, again with two authors independently reviewing each title to determine the article's relevance to the research question. If either reviewer identified a title for inclusion or further review, the abstract for that study was obtained with the process of independent blinded review by two authors repeated. Again, studies were only excluded if both reviewing study team members indicated a lack of relevance. The search was executed in October 2010. The search result of primary interest was the intersection of the four search subsets (Figure 1).

![Figure 1: The Exact Match Search Intersection](image-url)
The citations for all of the articles identified by the intersection of the four search subsets (Exact Match) were distributed among two of the authors who independently reviewed each title to determine the article's potential relevance to the research question. Authors were blinded to each other’s appraisal. Those titles for which both reviewers indicated a lack of relevance were excluded. For the remaining citations, the study abstracts were obtained, with the process of independent, blinded review repeated. Again, studies were only excluded if both reviewers indicated a lack of relevance. Finally, the full manuscripts for the retained citations were reviewed using a data collection sheet to further screen and characterize the article, and to extract relevant information about each study.

Table 1: Search Strategy Thesaurus for Policy and Planning Activities

<table>
<thead>
<tr>
<th>MEDLINE MeSH</th>
<th>CINAHL Subject Terms</th>
<th>PsycINFO Terms</th>
<th>ERIC Descriptors</th>
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<tr>
<td>regional health planning/</td>
<td>Health and welfare planning</td>
<td>Management planning</td>
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### Table 2: Search Strategy Thesaurus for Natural or Man-Made Disasters

<table>
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### Table 3: Search Strategy Thesaurus for Schools and Educational Institutions

<table>
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<tr>
<th>MEDLINE MeSH</th>
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<td>Table 4: Search Strategy Thesaurus for Children with Disabilities</td>
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<td>Affective disorders</td>
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Results of the Search
The four searches identified 25 unique Exact Match articles indexed by search terms contained in all four search subsets, and another 1,055 Near Match articles indexed by search terms contained in at least three of the four search subsets. Ten articles - three of the Exact Match and seven of the Near Match citations—were identified as meeting the criteria for full manuscript review. Of the remainder, 65 articles were identified as reporting some relevant information even though they did not meet the specific inclusion criteria, and another 35 articles were identified as addressing psychological or emotional
disabilities arising as a result of (rather than existing at the time of) a disaster. Figure 2 shows the screening process and results at each step.

**Figure 2: Search and Screening Process Results**

Results of the Full Manuscript Review
Our search revealed the scant nature of the empirical research regarding school disaster planning for children with disabilities. Of the ten citations retained for full manuscript review, none explicitly addressed the four inclusion criteria; that is, (1) planning or policies related to (2) natural or human-made disasters in (3) primary and/or secondary (K-12) schools with specific reference to (4) children with disabilities. Review of the articles that were a near match also revealed an additional, relevant research report which was not identified by the initial database search as it was not a peer reviewed publication but rather a published U.S. government commissioned research report (Chung et al., 2008). Four of the articles did at least incidentally mention or allude to all four of our criterion issues (Kano & Bourque, 2007; Kano, Ramirez, Ybarra, Frias, & Bourque, 2007; Graham, Shirm, Liggin, Aitken, & Dick, 2006; Peek & Stough, 2010). Two peer reviewed publications and a government report were concerned with either disaster planning in schools or disaster planning for people with disabilities, but not the intersection of those issues (Campbell, Gilyard, Sinclair, Sternberg, & Kailes, 2009; Chung et al., 2008; Tigges, 2008). The remaining four articles addressed various aspects of school medical emergencies (Olympia, Wan, & Avner, 2005; Pines, 2001) or fire/tornado evacuation plans and drills (Asher & Pollak, 2009; Self, Scudder, Weheba, & Crumrine, 2007) but not the broader issue of disaster planning. All of the articles were specific to the U.S. The salient points from the papers are discussed below.

The Challenges
Some of the issues facing children with disabilities are well highlighted in the papers, even if they are not specific to school disaster planning for children with disabilities. Children with disabilities are at the highest risk of being impacted by climate change effects (Peek & Stough, 2010). Although, like other vulnerable populations, they consist of diverse groups with differing circumstances, they all lack access
to social and economic resources, possess limited levels of social capital, power, and autonomy, suffer disproportionately following extreme weather events, and are at greater risk of being affected by ecological change (Peek & Stough, 2010). Extreme weather events and ecosystem changes place children with disabilities at amplified health risk due to their physical, psychological, educational, and/or social vulnerability (Peek & Stough, 2010).

People with disabilities are often dependent on others for important aspects of their daily activities, and their support system can be disrupted in disaster situations (Campbell et al., 2009). This is particularly the case with school children, who might be separated from their parents for prolonged periods (Peek & Stough, 2010). Students with limited mobility are vulnerable in the acute phase of a disaster when evacuation might be necessary (Asher & Pollak, 2009; Peek & Stough, 2010), and additionally vulnerable in the recovery phase when accessibility accommodations are often the last components of infrastructure to be restored (Peek & Stough, 2010). Communication disorders can affect how quickly a student becomes aware of an (impending) disaster, their access to emergency information during a disaster, and their ability to request assistance (Campbell et al., 2009). Children with autism-spectrum disorders can be particularly vulnerable in the high-stimulation setting of emergencies and disasters (Self et al., 2007; Asher & Pollak, 2009).

School Preparedness

One large report commissioned by the U.S. Agency for Healthcare Research and Quality conducted an analysis of emergency response plans from school districts in Massachusetts, Florida, Wisconsin, Colorado, and California (Chung et al., 2008). Despite the fact that of the 20 school districts that the study targeted only 8 agreed to participate, their comprehensive study concluded that while every school had well-established evacuation plans, few had plans for relocation, fewer had lockdown plans, and virtually none had sheltering-in plans which could be vital for cyclones, floods and so on. Many plans were not necessarily practical to implement in the particular school setting and omitted specific guidelines for communication between local emergency responders and the school. Importantly for the purpose of this review, the authors report that none of the schools had planned effectively for the management of special populations, though they do not specify children with disabilities or special health needs.

Five papers reported surveys of school preparedness, although one of these was an unpublished thesis that made no mention of children with disabilities (Tigges, 2008) and another explored preparedness for acute medical emergencies, not the broader issue of disaster planning (Olympia et al., 2005). While the other three published research papers evaluated preparedness for both individual medical emergencies and larger disasters, there was little—if any—distinction between the two in the reported results (Graham et al., 2006; Kano & Bourque 2007; Kano et al., 2007). Indeed, the most commonly reported emergency or disaster events included animals on campus, strangers on campus and power failure (Kano & Bourque 2007; Kano et al., 2007). Similarly, the studies did not differentiate between children with disabilities and children with special health care needs, which are not necessarily synonymous.

Most schools in the U.S. seem to have an emergency and/or disaster plan of some kind (Chung et al., 2008; Graham et al., 2006; Kano et al., 2007; Kano & Bourque 2007; Olympia et al., 2005; Tigges, 2008), and about three-quarters of U.S. schools have an evacuation plan that explicitly includes provisions for children with special needs (Graham et al., 2006). Graham et al. (2006) noted that of the schools responding to their survey (response rate was 58.2%, 2137 usable surveys returned), most (86.3%) reported having a disaster plan and an evacuation plan (95.6%) but almost one third (30%) had never conducted a drill. Almost one quarter (22.1%) made no disaster plan provisions for children with special health care needs, and one quarter reported having no plans for post-disaster counselling. Almost half (42.8%) had never met with local ambulance officials to discuss emergency planning. Urban school districts were better prepared than rural districts on almost all measures in the survey. A clear and unresolved problem concerns the 41.8% of non-responding schools and the reasons for this lack of participation in such an important research study, a similar issue encountered with the Chung et al. (2008) report.

Olympia et al. (2005) reported that school nurses generally feel prepared to manage acute medical emergencies, including those experienced by children with special needs, but they did not explore school nurses’ preparation for, or their perceived confidence with, providing for the chronic or routine care needs of such children as might be required in the context of a disaster. The availability of supplies for children with special medical needs varies by school and school district: 67% of staff at California
elementary schools reported having adequate supplies, but only 37% of staff at California high schools reported having such supplies (Kano & Bourque, 2007); across three school districts in Los Angeles County, the proportion with supplies for children with special needs was about 50% (Kano et al., 2007). Importantly, as all of these reports were centred in the United States, the state of school planning for emergencies in other countries such as Australia cannot be determined from this literature search.

Discussion
Disasters have immediate mortality effects as well as longer term effects, including the mental health consequences of social, economic and demographic dislocation subsequent to disaster (Haines, Kovats, Campbell-Lendrum & Corvalan, 2006; Garnaut, 2008). In addition to the immediate and longer term direct impacts of events such as fire, heat waves, cyclone or flood, climate change is also set to also have indirect health effects through disturbances of natural ecosystems that will affect the distribution and incidence of vector, food-, water-borne and allergen-related respiratory diseases (Haines et al., 2006).

The adverse impacts of climate change will be greatest for those most vulnerable: people on lower incomes, the elderly, the sick, women, members of ethnic minorities, children and those with disabilities (Blaikie, Cannon, Davis & Wisner, 1994; Chou et al., 2004; Curtis, Mills & Leitner, 2007; Garnaut, 2008). The number of Australian children with severe disabilities was estimated to be 168,500 in 2009, the majority of whom were located in families in low-income households (29%) (AIHW, 2009). The most prevalent disabilities among children in Australia are intellectual/learning, estimated at 166,700 children (4.3% of the population), and physical/ diverse, estimated at 162,800 children (4.2% of the population) (AIHW, 2009). Both of these groups of impairments and their socioeconomic correlates are likely to place children with disabilities at increased risk of hospitalisation in the event of a heat wave scenario (Yardley et al., 2010), however no single study has been identified that has specifically examined the health risks faced by children with disabilities in such a weather scenario even though the literature concerned with heat waves is significant (Bouchama et al., 2007). Apart from the direct health impacts upon children with disabilities, it is important to also recognise that climate change health impacts upon these children have considerable ripple effects upon their families and carers. This is because of the demanding caring arrangements that exist between them and their families (Werts et al., 2007). Health impacts upon these children are therefore likely to compound the impacts of climate change upon their families, raising considerably the potential number of people affected by climate change events.

Proactive public policies can help prevent future problems. In Bangladesh, for example, the death toll due to cyclones and flooding in 1970 was 240,000 people. With emergency preparedness and multisectoral risk reduction programmes, the death toll of comparable or more severe storms was reduced to 138, 000 people in 1991 and 4, 500 people in 2007 (WHO, 2008). Effective public policies for disaster response are important (Garnaut, 2008), as a lack of preparedness for disease outbreaks or disasters can be catastrophic. The lack of preparedness and uncoordinated responses of the Canadian and Chinese health systems in response to SARS in 2003 exacerbated that disease outbreak and led to the establishment of a national public health agency in Canada (WHO, 2007). By contrast, effective, rapidly responding, public policies can prevent acute threats to the public’s health. Disasters, or disease outbreaks, demand a rapid response capacity whether that is invoking quarantines or travel bans or mobilizing health workers and institutions without delay. Such an effective response is more likely if there have been significant investments in preparedness (WHO, 2008).

Our review of the literature demonstrates that whatever investment in preparedness schools have made, the most vulnerable children—those with disabilities—appear to have been neglected in those efforts. In addition, existing school plans do not seem to include any provisions for what happens during the time when children with disabilities are commuting to and from school. During this time tens of thousands of children with disabilities will be in the care of bus drivers who likely: a) do not have their emergency contact information; b) do not have any information on their life support systems and medications; and c) do not have a plan for where they will take the children in the event of a disaster. While diversion to the nearest school would be an obvious choice if an emergency occurred, generally schools do not have a 'reception plan' to accept such incoming students stranded in the vicinity.

The gaps in school disaster planning for children with disabilities are huge. In all fairness, there appears to be no empirical evidence upon which schools could be expected to develop policies specific to those vulnerable children. Our intent in this literature review was to identify and evaluate the evidence base for
school emergency plans and policies; unfortunately we have discovered that essentially there is not one to be found.

Conclusions and Implications
Notwithstanding the caveat that the reviewed literature does not extend to countries outside of the U.S., there are important consistencies across all of the papers identified in this review. First, there is strikingly little research on school disaster preparedness for disabled children; no paper identified by our search could be classified as research specifically on that topic. The closely related research is inhibited by the use of vague and inconsistent definitions of disability, and a lack of distinction between preparedness for everyday emergencies versus true disasters. Second, from the sparse data that are available we can deduce that most U.S. schools have emergency response and disaster plans (Chung et al., 2008; Graham et al., 2006; Kano & Bourque 2007; Kano et al., 2007; Tigges, 2008), but there are significant shortcomings in the extent to which schools appear to be prepared to assist and support children with disabilities or special needs (Graham et al., 2006; Kano & Bourque, 2007; Kano et al., 2007) beyond care for common emergencies and simple evacuation (Olympia et al., 2005; Graham et al., 2006). Lastly, common themes revealed in these papers show that children with disabilities often have additional vulnerabilities. For example, children with disabilities have a dependence on caregivers, which might be exacerbated during a disaster (Campbell et al., 2009; Peek & Stough, 2010). Students with mobility- and communications-related disabilities remain vulnerable throughout the continuum of the disaster cycle (Asher & Pollak, 2009; Peek & Stough, 2010) and possibly beyond (Somasundaram & van de Put, 2006). Further, children with a range of cognitive/psychological/emotional disabilities, particularly autism-spectrum disorders, can be uniquely vulnerable to the heightened sensory stimulation associated with emergencies and disasters (Self et al., 2007; Asher & Pollak, 2009).

The goal of mitigation is to minimize the effect of the disaster event and decrease the need for response, rather than simply increasing response capability (Council on School Health, 2008). From floods to pandemic influenza, there are measures that schools can take to decrease the risks these events pose to their students. An important first step for each school is to identify situations they are likely to be facing on the basis of geography and community trends.

Schools in Australia and the United Kingdom for which no literature appears to have been published in relation to school preparedness for disasters, will need to ensure that they are able to meet the challenges that weather related disasters impose. To address environmental disasters such as flash floods, cyclones and hurricanes, tornadoes and heat waves, schools should be having discussions with the local emergency planning committees. Together they can identify and catalog potential climate change induced disasters and resources to mitigate them. The local emergency-planning groups can work with schools to address local environmental vulnerabilities and provide resources for examining the school risk potential. Schools can then translate this information into school protocol and emergency/crisis plans.

Evidence-based information to guide school authorities is needed if schools are to play a role in mitigating and adapting to climate change health impacts. Issues surrounding the period pre and post an emergency as well as the response phase need to be examined. The range of questions that must be addressed before evidence-based policies can be developed and implemented include, but are not limited to, the following:

(1) To what extent do schools in countries other than the U.S. have adequate emergency plans and policies in place for all children including those with disabilities?
(2) How efficacious are the emergency policies that are in place in schools, for example for mitigating pandemics (Berkman, 2008) and how do those plans affect special populations such as children with disabilities?
(3) How prepared are school personnel and other personnel associated with schools, such as bus drivers, to deal with climate change induced emergency events and the particular, additional, needs of children with disabilities?
(4) Are school nurses available to attend to the needs of students with disabilities, particularly those with multiple disabilities in an extreme weather event?
(5) How prepared are school personnel during an emergency to deal with the range of issues attendant to the different types of disabilities that children may have? For example, to assist with evacuation processes for children with mobility impairment compared to those with visual or hearing impairments?
(6) What structural adjustments do schools need to have in place to meet the evacuation needs of children with a range of mobility issues?
(7) What facilities do schools need to deal with the contingencies presented by the health needs of children with various disabilities during emergency events, such as heat waves particularly in regards to school location (rural/remote)?
(8) Given that children experience heightened psychosocial vulnerabilities and lasting psychosocial burdens following disasters (Beaton et al., 2009), what training do teachers and other school personnel need to undergo to be able to meet the mental health impacts that might arise in all children as a result of a climate change event, including those children with particular developmental disabilities such as autism spectrum disorder and speech and language disabilities?
(9) What curricula are available or need to be developed to inform and prepare all children, including those with disabilities, to best meet the challenges of climate change induced emergencies, taking into account the possible structural disadvantage that particular families might have?
(10) What plans can be put into place to deal with emergencies that arise during the commuting periods to school, just before and just after regular school attendance times?
(11) Since schools have been identified as are key places for carrying out hazard education initiatives (for example, Finnis, Johnston, Becker, Ronan, & Paton, 2007) are schools effectively engaging parents of children with disabilities to prepare them to respond to an extreme weather event?

There is consensus among scientists that in a context of unfolding climate change, extreme weather events will impact directly and indirectly upon human health. Most severe impacts will be felt by vulnerable groups such as children with disabilities. Clinicians and researchers have identified a critical need for a framework to improve the care delivered to children during public health emergencies in prior studies (for example, Beaton et al., 2009; Mohr, 2002; Murray, 2006; 2009). Despite the call for such a research focus, it appears the needs of children with disabilities, who form a sizeable proportion of the population of children in most countries, have been neglected. Schools can play a substantial role in supporting public health endeavours to adapt to climate change by protecting children, including those with disabilities. Future research needs to focus on issues outlined here because schools need practical knowledge about disability and evidence based information to guide the formulation of appropriate emergency plans.

References
Disgrace”. *Journal of the national medical association*, 97(10), 1334-1335.
SOCIAL SKILLS OF CHILDREN IN THE U.S. WITH COMORBID LEARNING DISABILITIES AND AD/HD

Thomas J. Smith
Steve Wallace
Northern Illinois University

This study examined data from the Special Education Elementary Longitudinal Study (SEELS, 2003) to compare the social skills of children in the U.S. with comorbid learning disabilities and attention-deficit/hyperactivity disorder (LD+AD/HD) to their peers with LD-only and AD/HD-only, and to assess how specific demographic factors moderate the relationship between disability status and social skill. Results showed that the social skills deficits of children with comorbid LD+AD/HD were more marked than those of children with LD-only. Additionally, family involvement significantly moderated the relationship between disability status and social skill, with increased family involvement associated with increased social skills among children with comorbid LD+AD/HD and AD/HD-only.

The development of social skills among children with disabilities has long been a concern among educators, parents, and researchers. Social skills and the development of healthy peer relationships in childhood are recognized as valuable predictors of community participation (Bryan, 1997; Gresham, 1981), long-term life success (Parker & Asher, 1987), and long-term quality of life (Guralnick, 2005). Social skills deficits may limit access to social and educational opportunities (Guevremont & Dumas, 1994; Landau & Moore, 1991), contribute to rejection by peers (Whalen, Henker, Castro, & Granger, 1987), and affect psychosocial adjustment in later adolescence and adulthood (Barkley, 1998). It is generally accepted that, compared to their peers without disabilities, children with disabilities show deficits in social skills (Fusell, Macias, & Saylor, 2005), and are more apt to experience social isolation (Pearl et al., 1998). They also show difficulty comprehending nonverbal cues and problem-solving (Cartledge, & Millburn, 1996; Forness & Kavale, 1996; Nixon, 2001).

While the social skill deficits among children with disabilities are fairly well-documented, less well understood are specific and relative distinctions in social skill among specific subgroups of children with disabilities (Fusell, Macias, & Saylor, 2005). When the social skills of children with a learning disability (LD) are considered, the picture is complex. Although numerous studies have demonstrated social skills differences between children with learning disabilities (LD) and children without LD (see meta analysis by San Miguel, Forness, & Kavale, 1996), other studies show no such differences (e.g., Cartledge, Stupay, & Kaczala, 1986). Similarly, studies have shown no differences in social skill when children with LD are compared to children with other disabilities (Schumaker, Hazel, Sherman, & Sheldon, 1982).

Among children with learning disabilities, much debate has centered upon whether observed deficits in social skills are an inherent characteristic of learning disabilities, or whether these deficits are due to other factors related to the presence of learning disabilities. A number of hypotheses (as summarized in San Miguel, Forness, & Kavale, 1996) have been proposed to explain these social skills deficits. These include: (a) neurological dysfunction that underlies the academic deficit of the child (Boucher, 1986; Bryan, 1982; Oliva & La Greca, 1988; Renshaw & Asher, 1983; Wiener, 1980), (b) poor self-concept, peer rejection, or other social obstacles that ensue from poor academic performance (Osman, 1987), (c) limited environmental opportunities for the child (Gresham, 1988), (d) reduced social support from the family due to the stress of dealing with the child’s disability (Amerikaner & Omizo, 1984; Kronick, 1978; Wilchesky & Reynolds, 1986), or (e) the comorbidity of LD with other conditions, such as...
depression or attention-deficit hyperactivity disorder (AD/HD). The latter hypothesis, known as the psychiatric comorbidity hypothesis, was first proposed by Forness and Kavale (1991).

Although a number of studies have addressed the effects of LD+AD/HD comorbidity on academic outcomes (e.g., Mayes, Calhoun, & Crowell, 2000; Faraoone, Biederman, Monuteaux, Doyle, & Seidman, 2001; Tirosh, Berger, Cohen-Ophir, Davidovitch, & Cohen, 1998), the association of comorbidity on outcomes related to social skill is less well understood. Smith and Adams (2006), in their examination of data from the 2001 National Household Education Survey, found that parents of children with comorbid LD+AD/HD were significantly more likely than parents of children with LD-only to be contacted by teachers about behavioral problems at school. Flicek (1992) examined young boys with comorbid LD+AD/HD and compared their social skills to boys with AD/HD-only, LD-only, AD/HD + low achieving, low achieving (only), and a control group. When teacher and peer ratings of social skill were considered, children with comorbid LD+AD/HD showed the greatest impairment. Sprouse, Hall, Webster, and Bolen (1998) assessed social perception in a sample of 57 children with LD-only, comorbid LD+AD/HD, or children without disabilities. The authors report that children with comorbid LD+AD/HD did not show significantly lower scores in a facial expression subtest than either children with LD-only or without disabilities. They also found that, when teacher ratings of behavior were considered as an outcome, children with comorbid LD+AD/HD did not differ from children with LD-only in social perceptivity, but did show lower ratings than children without disabilities. In a study of 85 children with disabilities, Fusell, Macias, and Saylor (2005) found that the comorbid presence of LD+AD/HD did not significantly impair social skills compared to children with AD/HD-only or LD.

Findings, then, are mixed concerning the additive or intensification effects of comorbidity on the social skills of children with learning disabilities. Also, the studies examining the effect of comorbidity on social skills have been limited to relatively small sample sizes, with the exception of the study by Smith and Adams (2006). That study, however, did not examine social skills outcomes directly, but used indirect indicators such as suspension/expulsion and teacher contact of parents regarding behavioral problems.

The purpose of the present study was to use a large, nationally-representative sample of school-aged children in the U.S. to compare the social skills of children with comorbid LD+AD/HD to their peers with LD-only and AD/HD-only. A second purpose was to assess how these disabilities are related to demographic factors (gender, age, ethnicity, and poverty status). A third purpose was to examine how the interaction of disability status with specific demographic factors (gender, age, ethnicity, and poverty status), as well as the factors of school type and family involvement are related to social skill. To these ends, we addressed the following research questions:

1. Do the social skills of children with comorbid LD+AD/HD differ from their peers with either AD/HD-only or LD-only?
2. How are specific demographic factors (gender, age, ethnicity, poverty status) related to the occurrence of AD/HD-only, LD-only, and comorbid LD+AD/HD?
3. Do specific demographic factors (gender, age, ethnicity, and poverty status) moderate the relationship between disorder status and social skill?
4. Does family involvement moderate the relationship between disorder status and social skill?
5. Does type of school (regular vs. other) in which a child is enrolled moderate the relationship between disorder status and social skills?

Method
This study used data from the Special Education Elementary Longitudinal Study, Wave 1 (2003). The Special Education Elementary Longitudinal Study (SEELS) is a longitudinal data collection effort commissioned by the U.S. Department of Education’s Office of Special Education (OSEP). The data pertained to U.S. school students age 3-13 classified as special education students. A complex stratified sampling design was used to select participants, with local education agencies (LEAs) selected first, and students within LEAs selected second. This sampling design had implications for the data analyses carried out. First, due to the selection strategy, particular subgroups in the population were over-represented and other subgroups under-represented. Second, the cluster sampling methodology used resulted in observations that were not independent, which created the possibility of artificially small standard errors. To address these issues, we carried out all analyses using the SPSS Complex Samples module, implementing the sampling weights supplied with the data, and adjusting all standard errors and
significance tests using the supplied cluster and stratum information. Institutional Review Board (IRB) approval was obtained from the authors’ home institution.

Analyses for this study were carried out using data from Wave 1 of the Parent Interview, which included parent reports of each child’s demographic characteristics, school and family characteristics, school experiences (including school programs, extracurricular activities, and related services), and various academic, behavioral, and attitudinal outcomes. The total (unweighted) sample size was \( n = 4059 \). Disability status was determined by asking each parent or guardian (hereafter, parent) to confirm the reported disability designation provided by the school district.

To assess the social skills of these children, scores on a Child Social Skills Scale (CSSS) were considered. The CSSS consisted of eleven items pertaining to specific social skills of the child (see Table 1). For each item, the parent being interviewed was asked to indicate how often her or his child demonstrated the indicated social skill (0 = never, 1 = sometimes, 2 = very often). For each child, a composite CSSS score was obtained by summing the item scores for the eleven items. Higher composite CSSS scores reflected stronger social skills and lower scores indicated poorer social skills. Scores on the CSSS demonstrated adequate reliability (coefficient alpha = .78).

<table>
<thead>
<tr>
<th>Table 1. Child Social Skills Scale (CSSS) Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency that child…</td>
</tr>
<tr>
<td>joins groups without being told</td>
</tr>
<tr>
<td>makes friends easily</td>
</tr>
<tr>
<td>ends disagreements with respondent calmly</td>
</tr>
<tr>
<td>seems confident in social situations</td>
</tr>
<tr>
<td>avoids situations that are likely to result in trouble</td>
</tr>
</tbody>
</table>

Note. Response scale: 0 = Never, 1 = Sometimes, 2 = Very Often.

To ascertain the disability status of each child, each interviewed parent was asked to confirm the school’s designation of the primary disability of the child. For the purposes of this study, three groups of children were considered: (a) children who were confirmed as having LD without another disability (hereafter, LD-only), (b) children with AD/HD and no other disability (AD/HD-only), and (c) children with both LD and AD/HD (hereafter, comorbid LD+AD/HD). To examine how disability status was related to selected demographic characteristics, analyses of cross-classification tables using the Rao-Scott procedure was carried out. The Rao-Scott procedure (Rao & Scott, 1987) is an adjusted version of the chi-square test of independence appropriate for examining associations between categorical variables when data from complex samples are used. To investigate the association of comorbid LD+AD/HD with social-behavioral outcomes, pairwise contrasts were constructed using the Child Social Skills Scale score as the dependent variable, and the Wald F-statistic computed, with error degrees of freedom equal to the number of primary sampling units minus the number of strata in the data (see Korn & Graubard, 1999). The Wald contrasts are appropriate for examining mean differences in scores when data are from complex samples. Significance levels were adjusted for multiple comparisons using a Bonferroni correction.

**Results**

Table 2 shows the population estimates (based on the provided sampling weights) for the frequency of children in each of the four specified disability categories; (LD+AD/HD, AD/HD-only, LD-only, neither AD/HD nor LD). As indicated, although children with AD/HD-only or LD-only comprised fairly large proportions of the population of children aged 3 to 13 with disabilities (17.5% and 27.7%, respectively), the proportion of children with comorbid AD/HD was not insubstantial. Specifically, 10.2% of the
population of children with disabilities was reported as having comorbid LD+AD/HD. Table 3 shows the demographic characteristics (gender, ethnicity, age, household income level) for the three groups. The mean age of children in the sample was 10.2 (95% CI: 9.96, 10.09). Analyses of cross-classification tables using the second-order Rao-Scott procedure (Rao & Scott, 1987) indicated that disability status was significantly associated with child’s ethnicity ($F(4.80, 992.99) = 3.33, p = .01$, age ($F(1.96, 406.45) = 8.45, p < .01$), gender ($F(1.98, 410.78) = 26.89, p < .01$), and family income ($F(5.55, 1147.86) = 35.68, p = .02$). Specifically, (a) compared to their white peers, Hispanic children showed a greater tendency towards LD-only, while African American children showed a greater tendency towards comorbid LD+AD/HD; (b) compared to younger children, older children showed a greater tendency towards LD-only or LD+AD/HD; (c) although girls were less likely to have any of the three disabilities than boys, relatively more girls had LD-only than either AD/HD or LD+AD/HD; and (d) low family income (less than $20K/year) was associated with a greater propensity towards comorbid LD+AD/HD designation for a child, low-middle income ($20K-35K) was associated with greater tendency towards LD-only, and higher income ($50K+) was associated with greater tendency towards AD/HD-only.

### Table 2. Frequency Distribution of Children with Specified Disabilities

<table>
<thead>
<tr>
<th>Disability status</th>
<th>Weighted sample frequency</th>
<th>Weighted population estimate</th>
<th>Lower bound</th>
<th>Upper bound</th>
</tr>
</thead>
<tbody>
<tr>
<td>AD/HD-only</td>
<td>468,141</td>
<td>413,251</td>
<td>523,030</td>
<td></td>
</tr>
<tr>
<td>LD-only</td>
<td>730,923</td>
<td>648,779</td>
<td>813,067</td>
<td></td>
</tr>
<tr>
<td>Comorbid LD+AD/HD</td>
<td>269,553</td>
<td>228,222</td>
<td>310,884</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>1,468,617</td>
<td>1,330,532</td>
<td>1,606,701</td>
<td></td>
</tr>
</tbody>
</table>

**Differences in Child Social Skills by Disability**

Table 4 shows descriptive statistics for the composite CSSS score by disability status. A set of pairwise contrasts was constructed to compare the mean scores of children with comorbid LD+AD/HD to each of the other two groups (AD/HD-only and LD-only). Age, gender, ethnicity, and family income were used as covariates to control for possible mediating effects. Results showed that children with comorbid LD+AD/HD showed significantly lower CSSS scores (i.e., weaker social skills) than children with LD-only ($F(1, 207) = 15.99, p < .01$), with a small-to-moderate effect ($d = 0.26$). No significant mean difference in scores was evident between children with comorbid LD+AD/HD and children with AD/HD-only ($F(1, 207) = 0.94, p = .67$).

**Moderating Effects of Gender, Ethnicity, Age, and Poverty Status of Child**

We next examined how various demographic variables might moderate the relationship between disability status and social skills. A general linear model (using disability status and gender as the fixed factors, and age, gender, ethnicity, and family income as covariates) indicated no significant interaction between disability status and gender ($F(2, 204) = 0.36, p = .70$). Similarly, when the interactive effects of child’s ethnicity, child’s age, and poverty status of the child’s family were considered, general linear models again indicated no significant interaction (See Table 5).

**Moderating Effects of Family Involvement**

We next considered how family involvement with the child at home moderated the relationship between disability status and child social skills (controlling for age, gender, ethnicity, and family income). To examine this, we considered responses of the parent to two survey items designed to assess family involvement at home: (1) **During this past school year, how often did you or another adult in the household help (child’s name) with (his/her) homework?**, and (2) **How often during this past school year did you or another adult in the household talk with (child’s name) about (his/her) experiences in school?** The summed scores for these two items constitute a family involvement at home score (SEEELS, 2006). A general linear model using this composite variable indicated a significant interaction with child’s disability status ($F(2, 198) = 8.69, p < .01$). As Figure 1 shows, children with AD/HD-only or comorbid
LD+AD/HD showed stronger social skills in home settings with high family involvement, while children with LD-only showed stronger social skills in settings where family involvement was low.

Table 3. Demographic Characteristics of Children by Disability Status
(Weighted Population Estimates)

<table>
<thead>
<tr>
<th>Gender</th>
<th>AD/HD-only</th>
<th>LD-only</th>
<th>LD+AD/HD</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Freq.</td>
<td>Percent</td>
<td>Freq.</td>
</tr>
<tr>
<td>Female</td>
<td>106,786</td>
<td>22.8%</td>
<td>279,680</td>
</tr>
<tr>
<td>Male</td>
<td>361,354</td>
<td>77.2%</td>
<td>451,243</td>
</tr>
<tr>
<td>Ethnicity</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>322,679</td>
<td>68.9%</td>
<td>440,793</td>
</tr>
<tr>
<td>African American</td>
<td>91,602</td>
<td>19.6%</td>
<td>144,106</td>
</tr>
<tr>
<td>Hispanic</td>
<td>41,863</td>
<td>8.9%</td>
<td>122,108</td>
</tr>
<tr>
<td>Other Ethnicity</td>
<td>11,997</td>
<td>2.6%</td>
<td>23,903</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Age</th>
<th>AD/HD-only</th>
<th>LD-only</th>
<th>LD+AD/HD</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Freq.</td>
<td>Percent</td>
<td>Freq.</td>
</tr>
<tr>
<td>7-9 years</td>
<td>168,160</td>
<td>36.4%</td>
<td>181,365</td>
</tr>
<tr>
<td>10-12 years</td>
<td>250,531</td>
<td>54.2%</td>
<td>467,129</td>
</tr>
<tr>
<td>13-14 years</td>
<td>43,652</td>
<td>9.4%</td>
<td>80,445</td>
</tr>
<tr>
<td>Family Income</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$0 to $20K</td>
<td>132,504</td>
<td>29.8%</td>
<td>207,157</td>
</tr>
<tr>
<td>$20,001 to $35K</td>
<td>102,368</td>
<td>23.1%</td>
<td>175,083</td>
</tr>
<tr>
<td>$35,001 to $50K</td>
<td>71,918</td>
<td>16.2%</td>
<td>122,681</td>
</tr>
<tr>
<td>Over $50K</td>
<td>137,259</td>
<td>30.9%</td>
<td>158,512</td>
</tr>
</tbody>
</table>

Table 4. Descriptive Statistics for Child Social Skills Scale (CSSS) by Disability Status

<table>
<thead>
<tr>
<th>Disability status</th>
<th>n</th>
<th>M</th>
<th>SD</th>
<th>95% C.I. for M</th>
</tr>
</thead>
<tbody>
<tr>
<td>AD/HD only</td>
<td>1512</td>
<td>12.77</td>
<td>3.90</td>
<td>(12.47, 13.08)</td>
</tr>
<tr>
<td>LD only</td>
<td>2361</td>
<td>14.10</td>
<td>3.65</td>
<td>(13.81, 14.42)</td>
</tr>
<tr>
<td>Comorbid LD+AD/HD</td>
<td>871</td>
<td>13.12</td>
<td>3.90</td>
<td>(12.58, 13.47)</td>
</tr>
<tr>
<td>Total</td>
<td>4744</td>
<td>14.15</td>
<td>3.84</td>
<td>(14.00, 14.30)</td>
</tr>
</tbody>
</table>

Table 5. Interactive Effects of Disability Status with Gender, Ethnicity, Age, Poverty Status, Family Involvement, and School Type

<table>
<thead>
<tr>
<th>Effect</th>
<th>df_effect</th>
<th>df_error</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disability status × gender</td>
<td>2</td>
<td>204</td>
<td>0.36</td>
</tr>
<tr>
<td>Disability status × ethnicity</td>
<td>6</td>
<td>208</td>
<td>1.83</td>
</tr>
<tr>
<td>Disability status × age</td>
<td>2</td>
<td>204</td>
<td>0.56</td>
</tr>
<tr>
<td>Disability status × poverty</td>
<td>2</td>
<td>204</td>
<td>0.60</td>
</tr>
<tr>
<td>Disability status × family</td>
<td>2</td>
<td>198</td>
<td>8.69**</td>
</tr>
<tr>
<td>Disability status × school type</td>
<td>2</td>
<td>204</td>
<td>2.82</td>
</tr>
</tbody>
</table>

Note. **p < .01.

Moderating Effects of School Type
When the type of school a child attended was considered as a possible moderator of the relationship between disability status and social skills, results approached significance ($F(2, 204) = 2.82, p = .06$). Here, when controlling for age, gender, ethnicity, and family income, children with AD/HD-only or LD-
only showed weaker social skills in regular school settings than in other school settings (i.e., special schools, magnet schools, charter schools, alternative schools, or other types of schools). In contrast, children with comorbid LD+AD/HD showed stronger social skills in regular school settings than in other school settings (see Figure 2).

Discussion
The development of social skills among pre-teen children is a key factor related to later academic and social success. Among children with disabilities, it becomes more an even more crucial element, as these children already face existing and substantial challenges related to their disability. The present study examined how the comorbidity of LD and AD/HD was related to social skills in children, and also examined factors that could potentially moderate this relationship. In this study, children with comorbid LD+AD/HD showed significantly lower social skills than children with LD-only. This result is consistent with the findings of Flicek (1992), but differs from the findings of Fusell, Macias, and Saylor (2005) or Sprouse, Hall, Webster, and Bolen (1998). Also, although this result does not directly confirm the psychiatric comorbidity hypothesis of Forness and Kavale (1991), it does not disconfirm it. That is, the observed social skills deficits of children with comorbid LD+AD/HD (when compared to the children with LD-only) are a result that would be predicted by this hypothesis. It should be noted however, that the SEELS data do not contain information on children without disabilities, so it was not possible to compare this group to children with LD-only. Specifically, it is still possible that, although they show stronger social skills than children with comorbid LD+AD/HD, children with LD-only may still present weakened social skills when compared to non-disabled children. Additionally, in the present study children with comorbid LD+AD/HD did not differ in social skill when compared to children with AD/HD-only. This differed from the findings of Fusell et al., who found children with AD/HD-only to have lower social skills than the children with comorbidity. Both findings, however, suggest that LD+AD/HD comorbidity at least does not appear to further impair the social skills of children with AD/HD-only.

Figure 1. Mean CSSS scores by disability status and family involvement.
A second notable finding was that a family income was associated with propensity towards distinct disabilities. Specifically, low family income was associated with a greater tendency towards comorbidity of LD and AD/HD, low-middle income was associated with greater tendency towards LD-only, and upper income was associated with greater tendency towards AD/HD-only. It is certainly possible that the particular environmental factors associated with low family income (e.g., lessened access to effective treatment or intervention, lower-quality living conditions, variations in diet, etc.) may contribute to the observed increase in comorbidity. These same factors, however, might just as easily influence the occurrence of LD or AD/HD in isolation, so they may not entirely explain this occurrence. Also, the association of gender with disability type, with boys showing more tendency than girls towards AD/HD-only and comorbid LD+AD/HD (as compared with LD-only) is consistent with previous findings (e.g., Biederman et al., 2002) that show AD/HD as more prevalent among boys. Biological or gender-related child-rearing differences are the most dominant reasons put forth to explain these differences (see e.g., Barkley, 1989; Reid et al., 2000).

Family involvement was identified as the only significant moderator of the relationship between disability status and social skill. Here, increased family involvement was associated with stronger social skills for children with either AD/HD or comorbid LD+AD/HD. This is consistent with findings by Xu and Corno (2003), who found that family involvement in a child’s homework was related to a child’s control of emotion; and also consistent with the results of Milne and Plourde (2006), who identified family involvement as the most influential contributor to students’ social achievement (showing an even greater influence than SES). In the present study, however, increased family involvement was associated with lower social skills among children with LD-only. This observation is more difficult to explain. Although it is possible that (as suggested by the results of Xu & Corno) family involvement has relatively greater effect on a child’s affective development than her/his cognitive development, and thus may affect children with AD/HD to a greater extent than children with LD, it does not explain why
children with LD-only who experience high family involvement exhibited weaker social skills than their peers with high family involvement. Although an attempt was made to control for a number of outside variables in this study, it is possible that the observed effect of family involvement is not causal (that is, higher family involvement causing lower social skills). Rather, it may be that children with more severe learning disabilities (and presumably weaker social skills) experience increased family involvement as a result of that increased severity. However, a similar argument could be made for children with AD/HD-only and comorbid LD+HD, where the negative relationship was not observed. The explanation for this association remains open, and certainly deserving of additional study.

Although the interaction of school type with disability status was not significant, the effect approached significance, and thus is also deserving of additional study. The nature of the observed relationship in this study was that children with AD/HD-only and LD-only showed higher social skills in a regular school setting, while children with comorbid LD+AD/HD showed higher social skills in non-regular school settings (special schools, magnet schools, charter schools, alternative schools, or other types of schools). These differences, if they indeed exist, might be explained in several ways. First, it is possible that children with comorbid LD+AD/HD in a regular school setting may, by virtue of their comorbid status, feel uniquely different from their peers without disabilities as well as from their peers with non-comorbid disabilities, and may lack the opportunity to form friendships with other students who share their experience. Children with LD-only or AD/HD-only, in contrast, may find the opportunity to assimilate into a heterogeneous school culture a challenging but achievable task that helps to promote their social development. Another possibility is that children with comorbid LD+AD/HD may experience the opportunity for more focused pedagogical attention and heightened understanding of and/or sensitivity towards the issue of comorbidity, as well as a curriculum that more effectively addresses the needs of a child with comorbidity, which may help facilitate social development. In contrast, children with AD/HD-only or LD-only who are in a regular school setting may find that existing curricular and pedagogical practices, shaped by the more recent attention given to these disabilities as they occur in isolation, effectively meet their needs and allow them to socially thrive. Finally, although in the present study an attempt was made to control for a number of outside variables, it is possible that children with more severe forms of comorbid LD+AD/HD (and presumably weaker social skills) may be more likely to find placement in a regular school setting, while children with less severe comorbidity may find themselves placed in a non-regular school setting, while the opposite is true for children with LD-only and AD/HD-only. This scenario, however, is difficult to envision, and difficult to rationalize.

Implications for Practice
The findings of this study have several implications for practice. First, given the recognized importance of social skill development in enhancing a child’s subsequent quality of life, together with the observed finding that children with comorbid LD+AD/HD show social skill deficits that exceed those of children with LD-only, it is critical these children are offered opportunities and experiences that serve to enhance their social skills. Specifically, this may involve ensuring that individualized education program (IEP) goals for children with comorbid LD+AD/HD address specific social skills, such as cooperation with peers, taking initiative in joining peer activities, and initiating conversations. It is also imperative that educators and parents increase their awareness of the potential for these social skills deficits among this specific population, and also increase their awareness of environmental situations that can serve to either exacerbate these deficits, or to address and rectify them. A teacher attuned to the specific social skill sensitivities of a child with comorbidity, for example, may be more apt to intervene in situations where the opportunity exists for the child to strengthen these skills, such as peer activities, recreational activities, or cooperative group work. It is also essential for educational professionals to communicate clearly and effectively with parents of children with comorbid LD+AD/HD, helping them to understand the unique social skills challenges that their children experience, and how these challenges might be effectively addressed. Additionally, given the finding that increased family involvement is associated with increased social skill among these children, it becomes critical that parents are educated about the key role they can play in enhancing these social skills, and that parents and educators work together to develop a shared approach to these challenges.

References


TEACHERS’ USE OF MOTIVATIONAL UTTERANCES IN SPECIAL EDUCATION IN NORWEGIAN COMPULSORY SCHOOLING. A CONTRIBUTION AIMED AT FOSTERING AN INCLUSIVE EDUCATION FOR PUPILS WITH LEARNING DIFFICULTIES?

Geir Nyborg
University of Oslo

This observational study illustrates how teachers’ use of motivational utterances is expressed to pupils with learning difficulties in special education in Norwegian compulsory schooling. The term motivational utterances refers to teacher utterances that can help increase pupils’ expectancy of success and task value. Video recordings were made of teachers in special education who were deemed to be proficient in motivating pupils. The results indicate that methods used by teachers to improve pupils’ expectancy of success in a subject can be divided into six categories: subject-affirmative praise, subject-oriented behavioral praise, subject-detailed praise, existing knowledge, pupil emphasis and challenging utterances. The results also indicate that the methods used by teachers to increase pupils’ task value can be grouped into seven categories: pupil involvement, choice, justification, enthusiasm, downplaying the degree of difficulty, utility value and reward. These categories can raise awareness and serve as inspiration for other teachers, which in turn may foster learning among pupils with learning difficulties. Consequently, the categories and the use of motivational utterances are able to contribute to a differentiated and inclusive education.

This article reports on an observational study conducted in primary and lower secondary schools in Norway. The focus is aimed at illustrating how teachers’ use of motivational utterances is expressed to pupils with learning difficulties in special education. The objective of the study is to devise categories that illustrate motivational teacher utterances. The intention of the categories is to raise awareness and serve as inspiration for other teachers, which in turn may foster learning among pupils with learning difficulties. The categories and the use of motivational utterances are consequently able to contribute to a differentiated and inclusive education.

Background
The background to the study can be viewed in conjunction with another observational study, where the quality of mediational teaching was evaluated in four cases consisting of teacher and pupil dyads in primary and lower secondary schools in Norway (Nyborg, 2011; Nyborg, 2008). The term mediational teaching is based on Feuerstein’s theory of mediated learning experience (Feuerstein, Rand, Hoffman, & Miller, 1980; Feuerstein, Rand, & Hoffman, 1979). Mediational teaching is interpreted as a process by which a teacher mediates a given curriculum using certain categories in interactions with a pupil. The categories are focusing, affecting, expanding, competence, regulation and different. It was concluded that the quality of mediational teaching was low in all four cases. This was due to the lack of diffusion of the teachers’ use of the six criteria, particularly in relation to competence and affecting. Competence describes the teacher’s expressions of satisfaction with the pupil’s behavior. Affecting consists of the teacher’s utterances which express appreciation or affect (Nyborg, 2011). The absence of these two criteria indicates that teachers may benefit from learning how they can apply these types of utterances in special education in practice. Accordingly, the focus of this study is aimed at teacher utterances that can motivate pupils with learning difficulties.

Feuerstein’s theory encompasses various aspects that can affect individuals’ cognitive development (Klein, 2001; Feuerstein et al., 1980; Feuerstein et al., 1979). The criteria under mediational teaching
therefore have rather different content (Nyborg, 2011). This study was only to examine criteria associated with teacher utterances with a focus on competence and affecting-related utterances. The study therefore had to be founded on a theory basis with a narrower focus, which was more closely aimed at qualities characterized by these two criteria. A common denominator for the criteria is that they can help improve pupils’ motivation in connection with tasks related to curriculum content (Nyborg, 2011). Theory of motivation was therefore regarded to be a favorable basis for continuing the research based on Feuerstein’s theory.

Differentiation and inclusion are fundamental principles for all teaching in Norwegian schools. These principles entail the school actively taking into account, and endeavoring to meet the diversity of children and young persons’ different abilities and backgrounds through the teaching that is offered (Report no. 18 to the Storting, 2010-2011). The most important resource for fostering an inclusive education is teachers’ pedagogic expertise (Wah, 2010). Various sources have pointed out that motivation is a key element for teachers to prioritize in teaching in order to facilitate pupils’ learning (Pressley, Mohan, Raphael, & Fingeret, 2007; Pressley, Gaskins, Solic, & Collins, 2006; Brophy, 2010). This particularly applies to pupils with learning difficulties. Research indicates that pupils with learning difficulties have more problems with motivation than other pupils (Klassen & Lynch, 2007). Teachers can influence the pupils’ motivation in various ways (Schunk, Pintrich, & Meece, 2008). One aspect that is significant is the verbal utterances that teachers use in order to foster the pupils’ motivation (Klassen & Lynch, 2007; Bandura, 1997). Such utterances can be described as motivational teacher utterances. In view of this, teachers’ use of motivational utterances in special education may be a key factor in facilitating an inclusive education for pupils with learning difficulties.

Theory on motivation
A theoretical framework that can provide a valuable perspective in connection with teachers’ use of motivational utterances is the expectancy-value theory on expectancy of success and task value (Brophy, 2010; Green, 2002). Within this framework, the theory of Wigfield and Eccles in particular has generated research on academic achievement in classroom settings (Schunk et al., 2008). Here motivation is defined as dealing with and influencing pupils’ choice, persistence and performance (Wigfield & Eccles 2002; 2000; 1992). The theory assumes that a pupil’s motivation is the result of expectancy of success and task value. Expectancy of success relates to the child’s perception of how well he/she will be able to perform a specific task. This applies to expectancy of success in connection with performing a future task as well as the child’s perception of success in connection with a task he/she is about to perform in a specific situation. Values in this context relate to how much pupil value working with specific curriculum content.

Wigfield and Eccles have conducted several longitudinal studies with a large number of pupils, where they have studied the pupils’ expectancy of success and values in the subject’s mathematics and English. They discovered that the pupils’ expectancy of success and value of the subjects at a given point in time could be related to future academic achievements and choices made in fields of study (Wigfield & Eccles, 2000; Wigfield & Eccles, 1992; Meece, Wigfield, & Eccles, 1990). According to the studies, by attempting to stimulate pupils’ expectancy of success and valuing of subjects, teachers will be able to help influence and improve pupils’ learning (Shunck et al., 2008). Thus, this theory can be described as a favorable basis for studying teachers’ use of motivational utterances.

Wigfield and Eccles’ theory has only previously been used to a limited extent as a basis for studying teachers’ use of motivational utterances. However, an observational study was carried out by Green (2002), who described how two competent teachers used motivational utterances in their teaching. In this connection, Green developed categories for expectancy of success and task value. Green’s study was helpful, and provided inspiration for this study. However, her study was conducted in ordinary classroom settings and in an American context. The categories developed by Green were therefore not considered to be directly transferrable to special education in Norway.

Research question
The study seeks to answer the following question: How is teachers’ use of motivational utterances expressed to pupils with learning difficulties in special education? Pupils entitled to special education have some sort of learning difficulties that can lead to insufficient learning outcomes in regular teaching. In Norway it is the Educational and Psychological Counseling Service (PPT) in each municipality that makes an expert assessment of whether a pupil has a need for special education. This assessment forms
the basis for an individual decision by the local authority, or the head teacher in the event of delegation (Nilsen, 2011; Education Act (Norway) 1998).

**Method**

Video was used as an observational tool. Using video in research has a number of benefits (Klette, 2009). Among other things, it provides the opportunity to review records several times. This is useful when trying to identify, as in this study, good examples of motivational utterances.

**Selection criteria**

A number of selection criteria were defined prior to the study. One of these was that the special education should be organized as teaching in small groups. Group teaching was preferred because this is a form of teaching that is commonly used in Norwegian schools (Report no. 18 to the Storting, 2010-2011). It was also decided that the pupils’ learning difficulties should be of a moderate nature. Parts of their teaching should therefore be organized within an ordinary classroom setting. It was further defined that the pupils should be at primary school. Then it was decided that the special education should consist of teaching in Norwegian and mathematics. The reason for this is that teachers’ motivational utterances can encroach on subjects. This is supported by Green (2002), who observed teaching in mathematics and literacy in her study. The teaching topic within the subjects was not specified. Prior to the observations, the teachers were asked to carry out the teaching as normal, and they were not to prepare any specific curriculum content. The terms curriculum content and tasks are used here in connection with the teaching topics and content areas that the teachers and pupils worked with.

Since the objective was to illustrate how teachers use motivational utterances, it was important to use teachers who could be assumed to be proficient in motivating pupils. The PPT in a large municipality was therefore contacted. The PPT has contact with many schools and teachers, and will therefore have an overview of competent teachers who carry out special education. With the help of PPT, I eventually found two teachers who were willing to take part.

Teacher A was a qualified general teacher and had further education in special education. She had many years of teaching experience and was responsible for the special education of a group of pupils in the 4th grade. All of these pupils had special education in Norwegian and mathematics. The frequency could vary, but at the time of the observations the group had special education three hours a week. Teacher B was a qualified pre-school teacher and special education teacher. She had been teaching for more than 10 years. Teacher B carried out special education for two groups that were observed. One of the groups consisted of three pupils in 6th grade who received special education in Norwegian two hours a week, and one English lesson. The other group was made up of three pupils in 6th grade who received special education in mathematics two hours a week. A total of eight video recordings were made of the special education lessons; four from each teacher, two in Norwegian and two in mathematics. The recordings lasted for 40-50 minutes.

**Method for devising the categories**

In line with the theory basis of the study, the main criteria that were selected in connection with the term motivational utterances were expectancy of success and task value. The definitions of these are given in the results section. The main criteria and the data material were used as sources for devising the categories. This approach entails a combination of deductive and inductive methods and can be described as analytic induction. Analytic induction is distinguished in that both theory and empiricism form the basis for the research (Patton, 2002).

The practical work was carried out in several stages. The first stage consisted of eight video recordings being made of the special education lessons, transferring them to computer and transcribing them by means of software called Hypertranscribe. Stage two was a thorough review of the transcripts in order to create the categories. When the transcripts contained a teacher utterance that could be classified as a motivational utterance, a definition was devised that was believed to be suitable for this utterance. The utterance was also coded with this definition. All similar utterances that were considered to have corresponding content in the data material were coded with the same term. Several categories were created using this method, and many teacher utterances were placed under each of these. The software used for this was called Hyperresearch.
Stage three consisted of quality assuring the categories. Each category was thoroughly assessed in order to confirm whether it had an appropriate name. In addition, all of the teacher utterances that were coded under each category were reviewed in order to determine whether they actually belonged under the relevant category. The objective here was to establish categories that best illustrate motivational teacher utterances and which were also the most mutually exclusive. When the process was complete, a total of 13 categories had been created, and 287 motivational teacher utterances were registered therein.

Stage four was the selection of one example of a coded teacher utterance for each category. Utterances were sought that were the most typical for the relevant group, i.e. those with a generalization value that made it suitable for illustrating the category, and for constituting a basis for forming characteristics for each category. Since more examples of motivational utterances were registered for teacher A than for teacher B, most examples were taken from teacher A.

Stage five consisted of devising characterizations for each category. The purpose of these characterizations was to provide descriptions that further contribute to illustrating the content in the categories. Stage six related to substantiating why a category was considered to belong to one of the main criteria. In this connection, the category was compared with the comprehension of the main criteria.

Results
The results consist of the categories for the main criteria. Characterizations for each category in the form of a title and the associated explanation of what it encompasses are presented below. One example of teacher utterances is then given in each category. The examples appear in dialogue sequences from the video recordings. Finally, reasons are given for the use of the titles and why the categories belong under the main criteria.

Main criterion – expectancy of success
This main criterion relates to the teacher’s utterances that are aimed at raising pupils’ expectations of success in connection with tasks related to curriculum content. A total of six categories were created under this criterion.

Subject-affirmative praise. This category describes utterances where the teacher only gives positive feedback on the pupils’ performance. The example is from a Norwegian lesson given by teacher B. The group is working on distinguishing between single and double consonants (the names are fictitious).

Teacher: Can you read what you have written? (looking at Julie)
Julie: Jeg har skrevet på den første (.) det viste seg at alle har kommet til rette ((reading)) (.) ans
Teacher: An s yes (.) and the second one
Julie: Line visste ikke hvor hun hadde de to fra ((reading))
Teacher: Yes, good
Julie: ((looking at the teacher))

The teacher’s praise is given in relation to the fact that the pupil has given the correct answer. The praise is therefore associated with the pupil’s knowledge of the subject. At the same time, no mention is made of what is positive about the pupil’s answer. The praise thus primarily acts as affirmation to the pupil that she has given the correct answer. Subject-affirmative praise was therefore chosen as the title. This is a simple form of praise since no details are given of what the praise is for. At the same time, the praise gives the pupil positive feedback on her performance, which can help raise her expectancy of success. Additionally, the praise is brief, and the teacher can therefore move quickly on with the teaching. However, too much of this type of praise will make the pupil too dependent on judging for herself what she has done that deserves praise. This can lead to doubt about whether the praise is justified.

Subject-oriented behavioral praise. The category consists of utterances where the teacher describes the pupil’s performance in a positive way and gives a description of the pupil’s behavior. The dialogue is from a Norwegian lesson given by teacher A. The pupils have been given several words on pieces of paper, which in combination make a sentence. The pupils are asked to form the sentence.

Robert: I’ve done it ((formed the sentence))
Teacher: What does it say?
Robert: Ronny is relaxing in his room ((reading his own text))
Teacher: Very good Robert (.) You did that without any help (.) Well done (.) Now you’re concentrating on what you should do
The praise is given in relation to the solution to the task, and can be characterized as subject-oriented. In addition, the praise is also linked to the pupil’s behavior. This is the background to the term subject-oriented behavioral praise. Here the pupil is also given positive feedback on his performance. This can help enhance the feeling of success. Certain aspects of the pupil’s behavior are also detailed, which adds to the positive feedback. This can give the pupil a better understanding of why he has been praised. However, over-use of this type of praise may also be unsatisfactory due to a one-dimensional focus on the pupil’s behavior.

**Subject-detailed praise.** This category identifies utterances where the teacher describes the pupil’s performance in a positive way and gives details that clarify to the pupil why he has received praise. The example is from a mathematics lesson given by teacher A, where the group is working on a text.

Teacher: How far do they cycle on the second day Frank?
Frank: Err.... 22 kilometers
Teacher: Look at the figures carefully (.) on the second day of cycling
Frank: The second day they cycle 22
Teacher: Does it say 22? ((pointing to the text))
Frank: 27 ((looking down at the text, putting his head in his hands))
Teacher: It was nearly right (.) Do you know the good bit? (.) You looked to see what was wrong and looked for the figures in the text (.) That’s exactly the right thing to do Frank (.) You tried to find information (.) I test you sometimes to see what tools you use to find the answer and instead of reading everything you just look for the numbers (.) That was very clever (.) Well done
Frank: ((looking up at the teacher, smiling))

The praise is given in connection with the pupil’s answer and can therefore be described as being associated with the pupil’s knowledge of the subject. In addition, details are given of why the answer was good. The praise is thus also detailed. Subject-detailed praise is therefore a favorable term for this category. This type of praise may lead to a positive learning experience since it is elaborated on with a justification. The justification may mean that the pupil is more likely to believe that the praise is deserved. However, over-use of this type of praise may also be problematic. In some cases, the justification for the teacher’s praise will for example be so obvious that expressing it seems unnecessary. The praise may then be perceived as irritating and have little effect. The three types of praise can all contribute to raising pupils’ expectancy of success in slightly different ways. However, uncritical use of one of the types of praise could have a negative impact. It can therefore be beneficial to vary the use of praise.

**Existing knowledge.** The category involves utterances where the teacher points out that the pupils have experience from working with similar curriculum content. The dialogue is from a Norwegian lesson. Teacher A introduces a task where the pupils are given several words on pieces of paper. The words make up a complete sentence, and the pupils are asked to form the sentence.

Teacher: Robert, you were wondering what this is in front of you ((looking at the pupil))
Robert: Yes
Teacher: We have worked a bit on this before (.) Those of you who have been in my reading group are used to seeing sentences that are cut into a string of words (.) What you see in front of you now is sentences that you have not worked with before (.) which you are to put together to form a proper sentence.
Robert: Ah, yes

The teacher points out that the pupils have done this type of exercise before. Existing knowledge can thus be a suitable term for this category. When the teacher makes such an utterance, this can help make the pupil feel confident that he will succeed in the tasks that is introduced. Thus, the category can help raise the pupil’s expectancy of success in connection with the curriculum content.

**Pupil emphasis.** This category contains utterances where the teacher draws attention to a pupil by highlighting positive actions or qualities of the pupil in relation to curriculum content. The dialogue is from a Norwegian lesson given by teacher A. The group is working on language awareness training. They are trying to identify several small words within a long word.
Teacher: You can place a line between the words like Robert is doing if you want (.). That’s a good way to do it (.).

Pupils: ((sitting and writing))
Robert: I’m just writing something
Teacher: Write it down as you go

We see here how the teacher draws attention to a pupil in connection with a task. *Pupil emphasis* can therefore be a suitable term for the category. When attention is drawn to a pupil in this way it may help the pupil to have a more positive feeling of success. It can also help to improve the other pupils’ feelings of success since they compare themselves with the other pupil, and believe they can do just as well. Social comparison can be an important source of stimulating the expectancy of success (Shunck et al., 2008).

**Challenging utterances.** The category consists of utterances where the teacher challenges pupils to be active in connection with curriculum content. The dialogue is taken from a mathematics lesson. Teacher A has explained fractions and the pupils are working on an exercise.

Teacher: You’re now going to show that you have understood it (.). You will be given an exercise ((distributing the exercise sheets)) and I think you’ll manage this in no time at all (.). I want to see that you’ve understood it

Pupils: ((looking down at their exercise sheets))
Teacher: Who can read the heading for me?
Martha and Frank: ((putting their hands up))
Teacher: Martha
Martha: How much of the figure is colored (.). Write the fraction
Teacher: Yes (.). You can start now

In the first assertion, the teacher makes a statement in which she challenges the pupils to solve the exercise. *Challenging utterances* can therefore be a favorable term for the category. An utterance of this type may contribute to the pupils having greater faith in succeeding with the exercise, since the teacher indicates that they are capable of handling the curriculum content. Thus, the teacher’s utterance can lead to the pupil having a better feeling of success.

**Main criterion – task value**
This main criterion relates to the teacher’s utterances that are aimed at increasing the degree to which the pupils’ value the curriculum content. Seven categories have been created here.

**Pupil involvement.** This category contains utterances in which the teacher involves pupil input in connection with communicating the curriculum content. The dialogue is taken from a Norwegian lesson. Teacher A is explaining what a factual text is when one of the pupils interrupts.

Teacher: In a factual text you can’t give your own opinions (.). You can’t write about something that is a belief (.). It must be true (.). What do you want to say Richard
Richard: Michael is cheering for Galaxy and he also said I bet that Galaxy wins
Teacher: There are no doubt some who want to say that Galaxy is the best team in the world (.). But the question is whether this is a factual text (.). As it’s not certain (.). You don’t think that Galaxy is the best team?
Richard: No
Teacher: But it may be the case that Galaxy is the best team for one season (.). Then Galaxy must win
Richard: Yes, but they’re at the bottom
Teacher: Yes but if they are at the bottom now then it’s only Michael who believes Galaxy is the best team because he is cheering for Galaxy (.). But our own opinions have no place in factual text (.). What you write in factual texts must be true

The pupil raises a point that appears to be irrelevant to the curriculum content being discussed. The teacher nevertheless manages to incorporate the pupil’s input into the curriculum content. *Pupil involvement* can therefore be an appropriate term for the category. When the teacher incorporates a pupil’s input it can lead to the pupil valuing the curriculum content more. It can then be demonstrated to the pupil that there is a correlation between the thoughts and ideas that the pupil has, and the curriculum content that the teacher is communicating.
Choice. The category describes utterances in which the teacher gives the pupils the opportunity to make a choice in connection with tasks related to curriculum content. The dialogue is taken from a Norwegian lesson given by teacher A. The group has jointly drawn up a thought map based on a factual text.

Teacher: Ok, I’m finding this really interesting. We’ve now made a thought map where it says much less than the text. Do you agree with that?

Pupils: Yes (all together)

Teacher: Martha, do you want to try and tell us about the spider by reading the thought map?

Martha: Okay.

The teacher gives her pupil the opportunity to choose whether she wants to perform the task. Choice can therefore be a suitable term for the category. When the teacher lets the pupil choose whether she wants to carry out the task it can give the pupil a feeling of co-determination. An enhanced feeling of co-determination can lead to the pupil placing more value on the tasks related to curriculum content.

Justification. This category involves utterances in which the teacher justifies to the pupils the reason for working with curriculum content. The dialogue is taken from a mathematics lesson. Teacher B and the pupils are working with a piece of text when one of the pupils makes an assertion.

Jennifer: You just said that we had to write down how we worked it out on the calculator. I didn’t understand.

Teacher: If you had to do this exercise you would do it on the calculator. What would you do in the calculator? What calculation would you do?

Jennifer: 7.8261 times 120

Teacher: And you would key that in to the calculator wouldn’t you?

Jennifer: Yes.

Teacher: And then you would get an answer. If you then just write the answer in your book then I don’t know how you have arrived at this answer. As long as you have understood what you have done then I’m not so concerned with the answer. I am more concerned with you writing the calculation down and understanding what you’re doing.

Jennifer: Okay.

The teacher gives a justification here for why the pupil should write the calculation in her exercise book. Justification was therefore chosen as a term for the category. When the teacher makes utterances that can be interpreted as a justification for why the pupil should carry out a task, the pupil may gain a better understanding of why it is to be carried out. This can lead to the pupil putting a greater value on the curriculum content.

Enthusiasm. The category consists of utterances in which the teacher expresses enthusiasm in connection with curriculum content. The dialogue is taken from a mathematics lesson given by teacher B, where the group is working on a text exercise.

Teacher: Angelina I thought you were going to write how much they pay for the house.

Angelina: Yes, that’s what I’m doing.

Teacher: You can write it here. (pointing)

Angelina: Okay.

Teacher: And how much they pay for the ferry trip.

Jennifer: Does it usually cost that much? That’s expensive.

Teacher: Here where it refers to the cost of the house and ferry trip. What currency is that?

Pupils: Danish kroner (all together)

Teacher: Danish kroner yes. So we need to find out if it’s more in Norwegian currency than Danish. It’s exciting to see if it will be more expensive.

Angelina: (smiling, looking at the teacher)

In her last statement, the teacher expresses enthusiasm in connection with the curriculum content. Enthusiasm can therefore be a favorable term for the category. The teacher’s expressions of enthusiasm can be transferred to the pupil. This means that the pupil can also become more involved. This in turn can lead to the pupil putting a greater value on the curriculum content.

Downplaying the degree of difficulty. The category describes utterances where the teacher plays down the degree of difficulty or the amount of work in connection with curriculum content. The dialogue is
taken from a Norwegian lesson. Teacher A is explaining to the group that it is to draw up a thought map based on factual texts.

Teacher: I will now give you a sheet containing various factual texts. They’re not that long and they’re not that difficult. I’ve made sure of that.

Richard: Okay
Teacher: The exercise we will do together is called the spider. Can you see the spider on the sheet in front of you?

Pupils: ((finding the right sheet))
Teacher: Good. I thought we could read a sentence each and for each sentence I think it would be a good idea to add something to the thought map. Do you agree?

Pupils: ((nodding their heads))

In her first statement, the teacher is telling the pupils that the curriculum content, in this case the factual texts they are to work with, is not particularly long or difficult. Downplaying the degree of difficulty was therefore chosen as a term for the category. Committing to and starting tasks can take a lot of effort. When the teacher plays down the degree of difficulty of the curriculum content, this can lead the pupils to believe that the curriculum content is less demanding than they had imagined. This can make it easier for the pupil to start the work. Thus it can lead to the pupil placing a higher value on the curriculum content.

Utility value. This category involves utterances in which the teacher highlights the utility value of curriculum content. The dialogue is taken from the same Norwegian lesson given by teacher A as above. The teacher is explaining to the group that it is to draw up a thought map based on factual texts.

Teacher: Today we are going to train more on thought maps and factual texts and training on these is very useful. You will be going up to 5th grade where it’s beneficial to fully understand how to use thought maps. Do you remember that I said in the last Norwegian lesson that if you are studying for a test you will have read a factual text. Do you remember that I asked that if you do a good job with the thought map what can it be beneficial to study for the test?

Pupils: ((looking at the teacher))
Teacher: Does the whole text have to be read or is it sufficient to read the thought map?

Richard: Only half has to be read
Frank: No, the whole factual text has to be read
Teacher: You need to read the whole factual text but if you have done a good job you have read the factual text you have also made a thought map based on the factual text and you will also study for the test.

Richard: Then it has to be read
Teacher: I’ll show you afterwards that if we do a good job with the thought map it can be enough to just read the thought map and still take in all the details but you need to do a good job. Isn’t that a good idea?

Pupils: ((looking at the teacher))

We see here how the teacher highlights the benefit of creating a thought map. Utility value can therefore be a suitable term for the category. Such utterances can lead to the pupil gaining a better insight into how the curriculum content they are working with can be of practical use. This can lead to the pupil putting a greater value on the curriculum content.

Reward. The category consists of utterances where the teacher gives the pupils rewards in connection with work on the curriculum content. The dialogue is taken from a mathematics lesson given by teacher B. The group is working with a text on currency and conversion from Norwegian to Danish kroner.

Belinda: But it was me the last time
Teacher: What do you mean?
Jennifer and Belinda: Milk
Teacher: Oh yes, you got the milk. Okay, what do we do now to find out what the Danish house costs, can you tell me?
Jennifer: Yes
Teacher: What does it say that I know Jennifer ((pointing to the sheet where the pupil has written))
Jennifer: I know that the house costs 4,570
Teacher: Danish kroner (. ) How much is it in Norwegian kroner (. ) Can you write down the calculation? (. ) The first person to find the answer can write it on the blackboard

In the last statement, the teacher is offering to reward the first one finished by writing the answer on the blackboard. Reward can therefore be an appropriate term for the category. When the teacher makes such a statement it can lead to the pupils wanting to get the reward. This can lead to the pupils putting greater value on the work with the curriculum content.

Discussion

Motivational utterances and special education as a contributor to differentiated and inclusive education

The aim of the study has been to devise categories that illustrate motivational teacher utterances. The intention of the categories is to raise awareness and serve as inspiration for other teachers, who in turn may foster learning among pupils with learning difficulties. Consequently, the categories and the use of motivational utterances may contribute to a differentiated and inclusive education. Use of the term inclusive education in this context can be problematic due to the fact that opinions on what can be characterized as inclusive education vary. Inclusion is often associated with the physical localization of where pupils with learning difficulties are taught (Wah, 2010). A one-dimensional focus on such an interpretation will mean that the understanding of the concept of inclusion will be closely linked to the organization of the teaching. This study has focused on special education organized as small-group teaching of pupils with learning difficulties. Some may maintain that this form of organization is exclusive and not inclusive since the pupils in the group are physically separated from their peers. However, inclusion should be given a broader interpretation than only relating to the organization of the teaching. Inclusion should instead be understood as a continuous ongoing process (Sebba & Ainscow, 1996), which relates to ensuring that all children, regardless of individual needs, receive a good quality education that is in line with their abilities and aptitudes. This entails pupils’ education in an inclusive perspective being organized in different ways (Kilanowski-Press, Foote, & Rinaldo, 2010; Scruggs, Mastropieri, & McDuffie, 2007). In this study, parts of the pupils’ education are organized outside the classroom since they have a need for closer follow-up by teachers and an individual differentiated teaching plan. The intention is to enable participation in ordinary education in the longer term. In line with a process-oriented understanding of the concept of inclusion, this special education will be aimed at and contribute to an inclusive education.

With regard to adapting education to pupils with learning difficulties, taking the pupils’ motivation into account can be a crucial factor. Pupils with learning difficulties struggle more with motivation than others. In view of this, teachers’ use of motivational utterances can play a key role in improving the pupils’ motivation (Klassen & Lynch, 2007). Raising the awareness of teachers in relation to the use of motivational utterances can therefore be an important contributing factor to fostering an inclusive education for pupils with learning difficulties.

Limitations

There are various components that can play a role in fostering motivation among pupils which are not discussed in this study. This can be illustrated by Bandura’s (1997) motivation theory on expectancy of success (self-efficacy theory). The term expectancy of success is understood in the same way as in the theory of Wigfield and Eccles. However, Bandura’s theory omits the value component (Wigfield & Eccles, 2000; Anmarkrud & Bråten, 2009). According to Bandura (1997), pupils’ expectancy of success can be affected by mastery experience, comparison with others (vicarious experience), verbal feedback (verbal persuasion) and physiological and emotional reactions. The most meaningful of these is mastery experience. Mastery experience is where pupils experience success in connection with the tasks they are working on. One key prerequisite for a mastery experience is that the tasks are adapted to the pupil’s level, thus enabling them to master the tasks (Nilsen, 2008). Teachers’ planning, adaptation and application of curriculum content will therefore be a key component in relation to pupils’ motivation (Dolezal, Welsh, Pressley, & Vincent, 2003). Adapting the curriculum content is not discussed in this study. This can illustrate that the study only examines a component that can affect pupils’ motivation. Several aspects of the teaching that can contribute to fostering motivation have therefore been omitted.

A further limitation has also been made. Using video recordings enables us to witness both the participants’ verbal utterances and non-verbal behavior. When devising the categories, only the teachers’ verbal expressions were used. Non-verbal behavior may also affect pupils’ motivation. Non-verbal behavior was not given priority because using video is a challenge with regard to dealing with the
complexity and volume of data. It will therefore be necessary to reduce the data that is to be analyzed (Klette, 2009). In principle, it is easier to devise categories for verbal utterances than non-verbal behavior since interpretations of visual expression are methodologically complicated (Silverman, 2006), and the interpretation of non-verbal behavior is subject to the observer’s personal predispositions or biases to a greater extent than verbal expression (Gall, Gall, & Borg, 2007). Only using verbal utterances in the categories was therefore deemed to be a necessary limitation.

It may be questioned why video was used as an observational tool when the teachers’ non-verbal behavior is omitted. It is due to a desire to ensure that the categories were devised on the basis of teaching situations where the pupils seemed to understand the teachers’ verbal utterances. The pupils’ non-verbal behavior demonstrated on the video recordings helped confirm that this was the case.

The limitations above are at the expense of elucidating several aspects of teaching that are significant to the pupils’ motivation. On the other hand, all research work entails limitations in relation to the phenomenon being studied. If this was not the case, requirements for transparency and candor in the research process would be difficult to meet (Gall et al., 2007). Accordingly, this study has limited itself to certain sub-aspects of motivation.

**Applicability of the results**

The intention of the categories is to raise awareness and serve as inspiration. Raising awareness relates to the categories contributing to other teachers being more aware of how, and to what degree, they use motivational utterances in their teaching. To what extent this is the case is seen in the applicability of the results (Gall et al., 2007). Since the study was solely based on observations of special education carried out by two teachers, we cannot know for certain whether the categories will have such a function. We do not know if they have the right content and scope to be suitable for other teachers. However, precautions were implemented to increase the applicability of the results. The teachers were selected because counselors at the PPT believed they were proficient in motivating pupils. They were therefore selected based on specific qualities. A selection strategy of this nature can be described as a purposeful sampling (Gall et al., 2007; Patton, 2002), and is commonly used (Pressley et al., 2007; Pressley et al., 2006; Green, 2002; Wharton-McDonald, Pressley, & Hampston, 1998). The video recordings showed that the teachers combined used a substantial amount of expressions with varying content that can be described as motivational utterances. It is likely that the selection strategy contributed to the categories having a scope and content that makes them suitable for raising the awareness of other teachers with regard to the use of motivational utterances in their own teaching. Hopefully the categories can therefore inspire teachers to develop an even more inclusive education.

**Implications for research**

It has been pointed out that the motivation theory of Wigfield and Eccles (2000; 1992) has previously been used to a very limited extent as a basis for illustrating teachers’ use of motivational utterances in special education. In this regard, the study can hopefully inspire other researchers who want to highlight how teachers can help to improve the motivation of pupils with learning difficulties. A likely continuance of the study is to apply the categories in a quantitative observational study. The use of categories and a coding scheme in educational research gives opportunities for comparing teaching practices across different contexts, and can therefore contribute to knowledge building and knowledge accumulation within the field of investigation (Klette, 2009). In accordance with this, using the developed categories in a quantitative observational study may contribute to valuable knowledge about teacher’s use of motivational utterances in different special educational contexts. The aim of the study will be to illustrate how frequently teachers use motivational utterances in general, and how often they apply the different categories to pupils with learning difficulties in special education.

**Conclusion**

Teachers’ motivational utterances can be crucial to improving the motivation of pupils with learning difficulties in special education. This study illustrates how teachers’ use of motivational utterances is expressed to pupils with learning difficulties in special education. The results show that teachers’ methods of increasing pupil’s expectancy of success can be arranged into six categories: subject-affirmative praise, subject-oriented behavioral praise, subject-detailed praise, existing knowledge, pupil emphasis and challenging utterances. The results further indicate that teachers’ methods of increasing pupils’ task value can be grouped into seven categories: pupil involvement, choice, justification,
enthusiasm, downplaying the degree of difficulty, utility value and reward. The purpose of the categories is to raise awareness and serve as inspiration for other teachers, who in turn may foster learning among pupils with learning difficulties. Consequently, the categories and the use of motivational utterances may contribute to a differentiated and inclusive education.

References


Lov om grunnskolen og den vidaregående opplæringa (opplæringslova) [Act relating to primary, lower secondary and upper secondary education (Education Act)] (1998).


THE BALANCE CONTROL OF CHILDREN WITH AND WITHOUT HEARING IMPAIRMENT IN SINGAPORE – A CASE STUDY

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The purpose of this study is to compare the balance control of participants with and without HI and also to investigate the effect of a Balance Programme (BP) on their balance control (HI; n = 2, M age = 7 years old). The BP consisted of six practice sessions of 45 minutes each. The Balance Tasks used to assess balance control were static Balance Tasks: two-leg stand, one-leg stand and dynamic Balance Tasks: in-place jump and in-place hop. Kinetic data such as the Centre of Pressure (COP) and the Ground Reaction Force (GRF) was captured using a force plate. The results revealed differences in Balance Tasks involving static and dynamic balance control between participants with HI and without HI. Improvement in balance control of the participants is observed for some of the Balance Tasks after the introduction of the BP which indicates the inconclusive effectiveness of the BP. The authors suggest that the instructional approach and number of practice sessions may be the contributing factors affecting the effectiveness of the BP. A new BP with an alternative instructional approach together with more practice sessions is warranted to benefit both children with and without HI so as to make inclusion possible.

Balance is an integral part of many movement tasks a person may perform (Burton & Davis, 1992). Balance control thus forms the vital foundation of all movements of which the development of balance control must take place first or in tandem to support other motor abilities such as balance (state of equilibrium required in stability) and coordination to execute motor tasks (Shumway-Cook & Woollacott, 1995; Williams & Ho, 2004). As balance is needed for maintaining overall functional independence and mobility throughout life, the development of balance control is essential to the development of motor skills and is critical to the learning of complex motor skills and the execution of coordinated motor behaviour (Chen & Woollacott, 2007). Poor balance control as a result of compromised balance conditions will inevitably affect motor strategies as one cannot activate muscle response synergies with appropriate timing, force and muscle response organisation (Shumway-Cook & Woollacott, 2007). For example, a child with poor balance control will display poor motor coordination and may subsequently result in poor motor learning (Williams & Ho, 2004).

Balance control have been widely researched in many population groups such as young children below 10 years old (Clark & Watkins, 1994; Roncesvalles, Woollacott & Jensen, 2001), the elderly (Demura, Kitabayashi & Aoki, 2008) and athletes (Gautier, Thouvareq & Larue, 2008; Matsuda, Demura & Uchiyama, 2008). As far as the populations with special needs are concerned, researchers have also investigated the balance control of populations with physical disabilities such as cerebral palsy (Chen & Woollacott, 2007; Shumway-Cook, Hutchinson, Kartin, Price & Woollacott, 2003) and developmental coordination difficulties (DCD, Sugden & Chambers, 2006), population with intellectual disabilities (Bilir, Guven, Bal, Metin & Artan, 1995; Galli, Rigoldi, Mainardi, Tenore, Onorati & Albertini, 2008) and populations with sensory disabilities such as children with hearing impairment (HI; Butterfield, 1987; Engel-Yeger, Golz & Parush, 2004). In addition, the review of literature has reported numerous movement programmes and motor intervention conducted with the intention either to enhance balance abilities or to reduce balance problems in various populations such as the elderly (Ramsbottom, Ambler, Potter, Jordan, Nevill & Williams, 2004), the children with intellectual disabilities (Wang & Ju, 2002).
and children with HI (Fotiadou, Giagazoglou, Kokaridas, Angelopoulou, Tsimaras & Tsorbatzoudis, 2002).

Hearing is an important sensory ability in the psychomotor development of humans as it forms the basis of communication for cognitive, affective and behavioural development and learning to take place (Aucter, Pyfer & Huettig, 1997). Hearing impairment can be referred to as a type of sensory disability which affects the sensory inputs resulting in the inability to hear normally. Children with HI refer to children with varying degrees of hearing loss, ranging from mild to profound. Studies investigating children with HI and their motor abilities have reported delayed motor development and in particular, poor balance abilities (Bilir et al., 1995; Brunt & Broadhead, 1982; Butterfield, 1987; Craft, 1985; Dummer, Haubenstricker & Stewart, 1996; Gayle & Pohlman, 1990; Weiss & Phillips, 2006; Wiegersma & Van der Velde, 1983). Notwithstanding the fact that many studies frequently reported children with HI having poor motor proficiency traits (Bilir et al., 1995; Brunt & Broadhead, 1982; Gayle & Pohlman, 1990; Weiss & Phillips, 2006; Wiegersma & Van der Velde, 1983), studies have shown that children with HI have comparable motor skills as their hearing peers except for balance abilities although the latter is limited (Butterfield, 1987; Butterfield, Mars-Hans & Chase, 1993; Dummer et al., 1996). Children with HI, similar to their hearing peers, show a positive age effect on their motor performance as they grow older (Butterfield & Ersing, 1986; Gkouvatzi, Mantis & Kambas, 2010). However, children with HI tend to score lower than their hearing peers on motor test items requiring good control of balance such as one-foot standing (Brunt & Broadhead, 1982; Gayle & Pohlman, 1990), heel-toe walking or walking on balance beam (Butterfield, 1987; Butterfield & Ersing, 1986). Therefore, some studies have suggested specific programmes such as tumbling and gymnastics (Fotiadou et al., 2002; Pennella, 1979), basic body movements practices (Langdale, 1984), dance (Hottendorf, 1989; Reber & Sherrill, 1981) and Asian martial arts (Sherrill, 1976) to improve balance and related motor abilities of children with HI which could enhance their motor skills and physical fitness.

In Singapore, about one in every 1,000 infants born (live births) are diagnosed with hearing loss (Irving & Ruben, 1998; Low, 2005). Further, one in four of these infants are identified with significant hearing loss (SGH, 2010). Based on a conservative prediction of the average number of infants born in Singapore annually to be about 37,500 or more (singstat, 2011), it is estimated that about 1,500 of infants are born with HI per annum and about 375 of them may have significant hearing loss. Although, information on the percentages of school children with HI in Singapore is not entirely readily available, the majority of the children with HI has been successfully included or integrated into mainstream education (Ho, 2007). The number of children with HI being included in the mainstream schools was also higher as compared to other sensory disabilities. For example, sixty-one children with visual impairment are included in mainstream schools. By contrast, five hundred and two children with HI are included in mainstream schools (MOE, 2002). In 2003, the number of children with HI receiving education in the two main special schools catered for HI (Canossian School & Singapore School for the Deaf) was 250 (Quah, 2004). In 2004, about 460 children with HI were included in mainstream schools (MOE, 2004). Based on this data, we could infer the possibility that more children with HI are in regular classrooms although this possibility needs further justification. Drawing from the number of infants born with HI and as more children with HI get included in regular classrooms, understanding their balance control and comparing with the hearing children is warranted. More importantly, designing appropriate movement programmes to cater to the needs of children with and without HI in regular schools is necessary to complement inclusion.

Understanding Balance Control with Kinetic Analysis
Despite international studies investigating the motor skills of children with HI (Butterfield, 1987; Dair, Ellis & Lieberman, 2006; Dummer et al., 1996; Horak, Shumway-Cook, Crowe & Black, 1988; Stewart & Ellis, 2005), similar studies that use kinetic analysis to understand balance control remain limited. Kinetic analysis measures the internal and external forces contributing to movement (Shumway-Cook & Woollacott, 2007) and thus depicts the cause of motion quantitatively. Kinetic data collection includes the measurement of the Centre of Pressure (COP) in anterior-posterior (AP) and medial-lateral (ML) directions and Ground Reaction Force (GRF) in the AP ($F_x$), ML ($F_y$) and vertical ($F_z$) directions. The motion of the COP represents an individual's control of body sway in static balance tasks (Cherng et al., 2007; Demura et al., 2008; Winter, 1995). Body sway is defined as the sway of the body used to maintain posture by harmonizing the function of postural muscles based on the information from visual, vestibular and somatosensory systems (Demura et al., 2008). A larger COP sway area displayed by a larger COP displacement and/or a larger COP velocity has often been used as an indicator of increased body sway.
and poorer balance control (Cherng et al., 2007). However, an improved balance control can also be exhibited through lesser deviation or root mean square of the mean COP displacement from the origin (RMS) and/or lesser mean distance or mean path length travelled by the COP (MPL) in both AP and ML directions (Palmieri, Ingersoll, Stone & Krause, 2002). In the task of balance with eyes closed (intentionally limiting a sensory system), one would expect the COP parameters values to increase depicting poorer balance control. Children with Developmental Coordination Disorder (DCD) were found to have greater difficulties in restoring two-leg standing balance by using vestibular and somatosensory systems with simulated absence of visual system (Cherng et al., 2007). Similarly, Clark and Watkins (1987) reported that normally developing children had poorer balance control when they closed their eyes in a single-leg standing task. Lindsey and O’Neal (1976) also observed that the balance skills of children with HI were more adversely affected than hearing children when visual cues were removed.

In addition, plotted information of $F_x$, $F_y$ and $F_z$ (in newton) versus time (in seconds) involving a series of movement cycles was also used to understand the balance control within the dynamic Balance Tasks. In Nonis, Parker and Larkin’s (2006) study, the authors used the information of movement cycles of repetitive hops to investigate the hopping performance of girls ($N = 51$; Age range: 3 – 6 years). Within the landing phase of each movement cycle, the first peak, known as the impact peak, generated the first maximum force ($F_i$) and the second peak, known as the propulsion peak, generated the first maximum propulsive force ($F_p$) was calculated. Normalised by body weight (BW), the authors propose that a lower value of $F_i/BW$ indicates better performance as the body uses lesser force to prepare before the execution of actual hopping task (Nonis et al., 2006). Conversely, a higher value of $F_p/BW$ will indicate better performance as the body used more force to propel the body upwards (Nonis et al., 2006). In addition, Parker, Monson and Larkin (1993) reported a significant positive age effect in repetitive jumping and hopping of girls ($N = 35$; Age range: 3.5 – 9.5 years) when the older girls were observed to perform significantly better than the younger ones in terms of the mean vertical force normalised by body weight ($F_v/BW$). Although $F_i/BW$, $F_p/BW$ and $F_v/BW$ can provide indicators of the performance of balance tasks involving dynamic balance, these only reflect force data in the vertical direction. Percentage distribution of force in anterior-posterior direction ($\%F_a$), medial-lateral direction ($\%F_m$) and vertical direction ($\%F_z$) against resultant force could then also be useful indicators of underlying ability of balance control in dynamic tasks (Nonis et al., 2006; Parker et al., 1993). A decrease in either $\%F_a$, $\%F_m$ or both and/or increase in $\%F_z$ would indicate that one is able to jump or hop better vertically on the same spot which could attribute to the improvement in dynamic balance control (Nonis, Parker & Larkin, 2004; Nonis et al., 2006; Parker et al., 1993).

**Motor Intervention Programme using Task-Specific Approach**

Albeit motor interventions delivered in the form of movement programmes to improve overall motor abilities and increase physical activity participation of children with HI are reported (Hottendorf, 1989; Langdale, 1984; Sherrill, 1976), similar programmes emphasising on improving static and dynamic balance does not seem well documented. Although Fotiadou and colleagues (2002), in the recent decade, shared how rhythm gymnastics can cause significant improvements in the dynamic balance of children with HI, little is known about the effect of a balance-focused programme that caters to both children with and without HI on their balance abilities. In addition, movement programmes based on different instructional approaches and their effects on children with and without HI are limited. However, there are many studies focusing on various instructional approaches which include activity-based, direct instruction and task-specific on other children with special education needs such as children who were found with developmental delay or at risk with developmental delay and/or with DCD (Apache, 2005; Block & Davis, 1996; Goodway, Crowe & Ward, 2003; Revie & Larkin, 1993).

The Balance Programme (BP) conducted on children with and without HI in this study aims to improve balance control in specific balance tasks using the task-specific approach. The aims of task specificity are to provide specific instructions and guidance during motor learning and give specific feedback to the motor performance of the respective motor skills introduced in the movement programme. The rationale of task specificity for developing and learning of motor skills are supported by various researchers (Larkin & Hoare, 1992; Marchiori, Wall & Bedingfield, 1987). These authors suggest that children who are poorly coordinated were able to acquire or improve some motor skills through intensive task-specific training even though they were observed to have limited ability to transfer motor learning of one skill to another (Larkin & Hoare, 1992; Marchiori et al., 1987). Revie and Larkin’s (1993) 8-week task-specific intervention on children with poorly coordinated movements ($N = 21$; Age range: 5 – 9 years) was also
used specifically for enhancing motor learning and motor performance. In addition, task-specific approach aligns with the direct instruction approach which is teacher-directed allowing the lesson to be highly structured and task-oriented and yet able to cater to individual needs by having the teacher to give precise feedback to the child and monitor their individual progress.

Presently, the motor abilities and physical fitness of children with HI in Singapore, particularly in relation to the information on their balance control, are not known to be documented. Further, the possibility of including children with and without HI within the same balance-focused movement programme to be conducted within the regular schools locally remains unclear. Therefore, the purpose of this study is twofold. Firstly, through this case study, we hope to understand and compare the balance control of children with and without HI. Secondly, it examined the effect of the BP that uses the task-specific approach on the balance control of the children with HI and without HI. It is hoped that the conclusion of this study will give us a better understanding of the balance control of children with and without HI and the effect of BP on their balance control. This will then form the basis for the development of movement programmes to include children with HI within regular Physical Education classes involving a larger population size.

**Method**

**Participants**

Two children participated in this study (\( N = 2, M \text{ age} = 7 \text{ years} \); see Table 1). Of the two participants, Participant HI was clinically diagnosed with profound hearing loss and Participant Non-HI is of normal hearing ability. Both had no pre-existing medical and health conditions during the period of study. Informed and voluntary consent was obtained from parents of the participants and the school in accordance with institutional review committee board for the ethics of human research at the National Institute of Education (NIE).

<table>
<thead>
<tr>
<th>Participant</th>
<th>HI</th>
<th>Non-HI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>Male</td>
<td>Male</td>
</tr>
<tr>
<td>Age (years)</td>
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<td>7</td>
</tr>
<tr>
<td>Height (cm)</td>
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<td>130</td>
</tr>
<tr>
<td>Weight (kg)</td>
<td>21.5</td>
<td>33.0</td>
</tr>
<tr>
<td>School Type</td>
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<td>Mainstream</td>
</tr>
<tr>
<td>Hearing Impairment</td>
<td>Profound with cochlear implant</td>
<td>Nil</td>
</tr>
<tr>
<td>Other Special Condition</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Completed BP</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

**Task and Apparatus**

The balance control ability of the participants was measured through four motor tasks, termed as Balance Tasks. The Balance Tasks involving static balance control were two-leg stand, one-leg stand and Balance Tasks involving dynamic balance control were in-place jump and in-place hop. The sequence of the Balance Tasks was two-leg stand with eyes open (EO), two-leg stand with eyes closed (EC), one-leg stand with eyes open (EO), one-leg stand with eyes closed (EC), in-place jump and in-place hop.

The Kistler Force Platform (Model: 9287BA) measuring 60 cm by 90 cm was used to capture the position coordinates of the Centre of Pressure (COP) in the anterior-posterior (AP) and medial-lateral (ML) directions and the components of the Ground Reaction Force (GRF) in the AP (\( F_x \)), ML (\( F_y \)) and vertical (\( F_z \)) directions. All these variables measure the participants’ static and dynamic balance of Balance Tasks. The data was captured at a sampling rate of 200 Hz.

**Procedures and Test Instructions**

This study adopted a single-subject research design consisting of a pretest (45 minutes), a task-specific Balance Programme (BP: 6 sessions, 45 minutes each) and a posttest (45 minutes) to compare the balance control of Participant HI and Participant Non-HI and examine the effect of BP through selected Balance Tasks involving static and dynamic balance. The pretest and posttest were conducted in the Biomechanics Laboratory at the University.
Prior to pretest, a familiarisation session with the participants and logistics preparation of the test venue and equipment set-up was carried out. Both face-to-face and phone briefings were conducted for the participants and their parents respectively to reduce any possible anxiety prior to the tests.

During pretest and posttest, each participant was tested barefooted individually. The participants were told to look straight ahead, fixating their gaze on a picture of a flower (15-cm diameter) positioned at eye level at a distance of approximately five meters while stepping forward to perform instructed Balance Tasks on the force plate. Their foot placement was self-selected. One trained tester collected the data throughout the study. The procedure for each task in both tests began with a demonstration and followed by a standardised command – Ready, Get Set, Go! as a signal for the participant to begin the task. In addition, Participant HI received visual and tactile cues to ensure that he understood the instructions given by the trained tester. Collection of the force data was manually controlled by the tester immediately upon the command to perform the Balance Tasks. Each participant performed three trials for each Balance Task. Adequate rest periods were given to each participant between trials and tasks. All three trials with continuous data performed by the participants were used for further analysis. In the event that continuous data was not captured in the first three trials of each Balance Task, the participants were allowed to perform up to a maximum of five trials.

The Balance Programme (BP)
The Balance Programme (BP; see Appendix A) consisted of 6 sessions using the task-specific approach (Larkin & Parker, 2002; Revie & Larkin, 1993). The activities during the task-specific approach were planned to teach the participants the techniques required to enhance specific balance control ability of the Balance Tasks of this study. Each session lasted 45 minutes and was divided into four phases: warm-up (5 minutes), task-specific and related-movement activities (35 minutes) and cool-down (5 minutes). The BP was conducted at the school of both participants.

Data Collection and Reduction
Static Balance Tasks (Two-leg Stand & One-leg Stand). Within a 10 second trial, the last five seconds of continuous force data (i.e. when the participant remained on the force plate) was analysed. The first five seconds of each trial included the preparatory time to step onto the KFP was disregarded to avoid capturing data that did not reflect the actual performance of the Balance Tasks. Chen and Woollacott (2007) used similar timing of five seconds to assess their participants’ balance control. In addition, Cherng et al. (2007) did not use data related to the preparatory time.

Dynamic Balance Tasks (In-place Jump & In-place Hop). Within a 10 second trial, data of eight full and continuous movement cycles (i.e. 8 continuous jumps and hops) were analysed. The first few jumps and hops were disregarded to avoid capturing preparation performance within each trial.

As adopted from Palmieri and colleagues (2002), the COP parameters for calculating the balance control of the Balance Tasks in this study are the root mean square of the COP displacement in AP (RMS$_{x}$) and ML (RMS$_{y}$) directions and the mean path length of COP distance in AP (MPL$_{x}$) and ML (MPL$_{y}$) directions. The kinetic variables for calculating the balance control of dynamic Balance Tasks are the mean percentage distribution of GRF in each direction to the summed GRF (%F$_{x}$, %F$_{y}$), the mean vertical force normalised by body weight (F$_{z}$/BW), the mean of first normalised maximum vertical force (F$_{z}$/BW) and the mean of normalised maximum propulsive vertical force (F$_{y}$/BW). The use of similar kinetic variables in this study has also been reported in various studies (Nonis et al., 2006; Parker et al., 1993).

Data Analysis
The RMS$_{x}$, RMS$_{y}$, MPL$_{x}$, MPL$_{y}$, %F$_{x}$, %F$_{y}$, F$_{z}$/BW, F$_{y}$/BW and F$_{z}$/BW were calculated for dynamic Balance Tasks across three trials. The means and standard deviations of three trials of COP parameters and kinetic variables of each Balance Task were used for descriptive data analysis. The pretest and posttest results were compared within and between participants.

Results
Performance of Static Balance Tasks at Pretest and Posttest
The Balance Tasks requiring static balance were two-leg stand and one-leg stand under two conditions – eyes open (EO) and eyes closed (EC). The pretest and posttest results of static Balance Tasks were compared. For two-leg stand performed under EO and EC conditions respectively, both participants experienced a decrease in MPL$_{x}$ and MPL$_{y}$ at posttest when compared to pretest (see Figure 1). A similar
trend was not observed for RMS values (see Figure 2). Nonetheless, the RMS_x, RMS_y, MPL_x and MPL_y values of Participant HI were comparatively higher than those of Participant Non-HI as per condition and as per test (pretest – EO, pretest – EC, posttest – EO, posttest – EC; see Figures 1 & 2).

Figure 1. Mean Path Length (MPL) of Two-leg Stand and One-leg Stand (EO – eyes open, EC – eyes closed)

However, the results of one-leg stand showed different results from those of two-leg stand. Only Participant HI was observed to have lower values of RMS_x, RMS_y, MPL_x and MPL_y at posttest when compared to his pretest results under both EO and EC conditions (see Figures 1 & 2). Participant Non-HI actually experienced increased MPL and RMS values in AP and ML directions at posttest (see Figures 1 & 2). However, similar to two-leg stand results, the RMS_x, RMS_y, MPL_x and MPL_y values of Participant HI were still comparatively higher than those of Participant Non-HI under both EO and EC conditions with the exception of the RMS values at posttest (see Figures 1 & 2). Comparing between tasks, the values of RMS_x, RMS_y, MPL_x and MPL_y of one-leg stand were generally higher than those of two-leg stand under both EO and EC conditions for both participants (see Figures 1 & 2).
Performance of Static Balance Tasks under Varying Vision Conditions
Studies have documented varying difficulties of static tasks under different vision conditions where participants generally exhibited poorer balance control when vision is limited (Cherng et al., 2007; Clark & Watkins, 1984). The COP results of two-leg stand and one-leg stand of both participants under EO and EC conditions were examined to understand the role of vision on balance control and on the effectiveness of the BP. This could then be used to better differentiate the balance control between participants with and without HI. Comparing the results of two-leg stand under EO and EC condition respectively, there was no clear indicative trend to show which vision condition performed better in both participants (see Figures 1 & 2). On the contrary, with the exception of MPL posttest results of Participant HI, the results clearly showed that the values of all COP parameters (MPLx, MPLy, RMSx & RMSy) were higher in the one-leg stand task for EC condition rather than EO condition for both participants (see Figures 1 & 2).

Performance of Dynamic Balance Tasks at Pretest and Posttest
The Balance Tasks requiring dynamic balance were in-place jump and in-place hop. Similarly, the results of in-place jump and in-place hop respectively were compared between tests and between participants. For in-place jump, the posttest results revealed lower MPLx, MPLy, RMSx and RMSy values in both participants when compared to their pretest results (see Figures 3 & 4). In terms of kinetics variables, both participants had lower %Fx and %Fy but higher %Fz at posttest (see Table 2). Both participants also attained an increase in Fz/BW and a decrease in Fx/BW at posttest (see Table 2). However, the differences in Fz/BW between tests did not show a discernable trend in both participants.
Comparing the in-place jump results of both participants, Participant HI had higher MPL\textsubscript{x} and MPL\textsubscript{y} values than Participant Non-HI at pretest and posttest (see Figure 3). The differences of RMS\textsubscript{x} and RMS\textsubscript{y} of both participants between tests did not show a consistent pattern (see Figure 4). In addition, Participant HI had higher %F\textsubscript{x} and %F\textsubscript{y} but lower %F\textsubscript{z} and F\textsubscript{p}/BW as compared to Participant Non-HI (see Table 2). Similar to the RMS values, the comparison of F\textsubscript{p}/BW and F\textsubscript{p}/BW between participants did not show a consistent pattern.

![Figure 3. Mean Path Length (MPL) of In-place Jump and In-place Hop](image)

Figure 3. Mean Path Length (MPL) of In-place Jump and In-place Hop
Figure 4. Root Mean Square (RMS) of In-place Jump and In-place Hop

Table 2. The Mean Values of the Kinetics Variables of In-place Jump

<table>
<thead>
<tr>
<th></th>
<th>Participant HI</th>
<th>Participant Non-HI</th>
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<tbody>
<tr>
<td></td>
<td>Pretest</td>
<td>Posttest</td>
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<tr>
<td>%F_x</td>
<td>15.13</td>
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</tr>
<tr>
<td>%F_y</td>
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<tr>
<td>%F_z</td>
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<tr>
<td>F_z/BW</td>
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<tr>
<td>F_p/BW</td>
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<td>0.928</td>
</tr>
<tr>
<td>F_p/BW</td>
<td>4.54</td>
<td>2.78</td>
</tr>
</tbody>
</table>

From the values of the COP parameters of in-place hop, except for the MPL_y and RMS_y values of Participant HI, lower values of posttest results were observed for both participants when compared with pretest results (see Figures 3 & 4). Similar to the results of in-place jump, both participants also had lower %F_x and %F_y but higher %F_z for the task of in-place hop at posttest (see Table 3). Both participants also experienced increase in F_p/BW and decrease in F_p/BW at posttest.
Discussion

Comparison of the Balance Control between Children with and without HI

In the present study, we compared the static and dynamic balance control of a 7-year old boy with HI and his hearing peer. With the exception of the root mean square (RMS) values at posttest of one-leg stand, it was noted that Participant HI generally scored consistently higher mean path length (MPL) and RMS values in anterior-posterior (AP) and medial-lateral (ML) directions in terms of static balance control when compared to Participant Non-HI (see Figures 1 & 2). Higher MPL and/or RMS values would indicate poorer balance ability (Palmieri et al., 2002). Although we could not deduce a conclusion in comparing the results of in-place jump and in-place hop of both participants using MPL and RMS values, the results using kinetic variables suggested that Participant HI had poorer dynamic balance control than Participant Non-HI. Participant HI had higher %F_x and %F_y but lower %F_z, F_y/BW and F_z/BW than Participant Non-HI for in-place jump and in-place hop. These findings support other studies which have reported poorer balance control in children with HI when compared with their hearing peers (Campbell, 1983; Lindsey and O’Neal, 1976; Wiegersma & Van der Velde, 1983).

Between eyes open (EO) and eyes closed (EC) conditions, in general, differences were revealed for static Balance Tasks. Specifically, both participants experienced poorer balance control for the task of one-leg stand under EC condition, especially at pretest (see Figures 1 & 2). One explanation could be related to the underlying visual system. Studies have reported that the role of visual system played an important role in controlling balance in standing tasks (Cherng et al., 2007; Clark & Watkins, 1984). However, discernable difference was observed for one-leg stand of both participants in this study and there was not much difference for the results of two-leg stand between EO and EC conditions. One could then possibly conclude that vision plays a significant part for more difficult Balance Tasks (e.g. one-leg stand) which require better balance control with a smaller base of support as compared to easier Balance Tasks (e.g. two-leg stand) of a bigger base of support.

Maintaining balance and postural control requires sensory inputs from visual, somatosensory, and vestibular systems as well as the integration of sensory systems within the environment (Shumway-Cook & Woollacott, 2007). Humans essentially rely on three main sensory systems – visual, vestibular and somatosensory systems to send sensory inputs through the CNS to generate motor outputs seen as static and/or dynamic movements. In addition, Lindsey and O’Neal (1976) observed that the balance skills of the participating children with HI were more adversely affected than those of normal hearing children when visual cues were removed. Therefore, one would suggest that humans use vision system more as compared with the auditory system although Horak and MacPherson (1995) recognized the use of auditory system in postural control. Since the children with HI have limitation in their hearing, it could be explained that they rely mainly on their visual system to make sense of the surroundings, including

<table>
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<tr>
<th>Table 3. The Mean Values of Kinetics Variables of In-Place Hop</th>
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<tr>
<td>Participant</td>
</tr>
<tr>
<td>HI</td>
</tr>
<tr>
<td>%F_x</td>
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<tr>
<td>%F_y</td>
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<td>%F_z</td>
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<td>F_z/BW</td>
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With the exception of MPL_y and RMS_y, Participant HI had higher MPL and RMS values than Participant Non-HI for in-place hop at pretest and posttest. In terms of kinetics variables, participant HI also attained higher %F_x and %F_y but lower %F_z, F_y/BW, F_z/BW and F_z/BW as compared to Participant Non-HI (see Table 3). Comparing the pretest and posttest results between dynamic Balance Tasks in terms of MPL and RMS values in AP and ML directions, it is unclear if both participants had shown improvement in balance control (see Figures 3 & 4). However, the performance of in-place hop of both participants generally showed a higher %F_x, %F_y and F_y/BW but lower %F_z, F_z/BW and F_z/BW (see Tables 2 & 3) as compared to in-place jump.
generating motor responses for balance control. This was further evidenced by the differences from the pre- and posttest results of Balance Tasks involving EC condition between Participant HI and Participant Non-HI. Except for the RMS values at posttest, Participant HI generally had much higher MPL and RMS values in both AP and ML directions as compared to Participant Non-HI under EC condition (see Figures 1 & 2).

Within participants, the comparison of the results between static Balance Tasks revealed that both participants performed better in two-leg stand than one-leg stand (see Figures 1 & 2). In terms of dynamic Balance Tasks, the performance of in-place jump was also better than in-place hop for both participants (see Tables 2 & 3). One would expect such findings due to the ground reaction forces generated with different bases of support at different postures (Parker et al., 1993). The tasks of one-leg stand and in-place hop require one to balance on single leg which causes lateral shift of body weight. Therefore, the execution of one-leg stand and in-place hop becomes relatively unstable when compared to two-leg stand and in-place jump which have a bigger base of support.

The Effect of BP on the Balance Control of Children with and without HI

Another aim of this study was to examine the effect of Balance Programme (BP) using the task-specific approach on the balance control of children with and without HI. The results of static Balance Tasks seemed to indicate a slightly different effect of BP between participants. Comparing the pre- and posttest results of two-leg stand and one-leg stand, Participant HI experienced an improvement in static balance control in terms of MPL and MPLy (see Figure 1). Improved balance control was seen in Participant Non-HI for the task of two-leg stand only. Participant Non-HI actually performed poorer in one-leg stand at posttest (see Figures 1 & 2). On the other hand, the results of dynamic Balance Tasks revealed a more consistent pattern for both participants. In terms of COP parameters, except for the MPL and RMS values of Participant HI, both participants improved the dynamic balance control of in-place jump and in-place hop. In addition, both participants also attained lower %Fy and %Fx but higher %Fx and Fy/BW which is indicative of improved performance as reported in other studies (Nonis et al., 2006; Parker et al., 1993).

In summary, the effect of BP on the balance control of participant with and without HI, there was some indication of overall improvement for both participants. As RMS is the standard deviation of the COP displacement, a larger RMS value will then indicate a lesser stability in balance control. Although overall improvement was observed in both participants in terms of mean distance travelled from the initial point of origin (i.e. MPL), it may not necessarily reflect a stabilized improvement in balance control without a consistently reduced RMS values at posttest. Therefore, the effectiveness of BP remains unclear with the inconsistent change, particularly in RMS values in AP and ML directions, Fy/BW and Fx/BW of both participants.

In the attempt to have an in-depth analysis of the effect of BP as per participant, the comparison between participant with and without HI was carried out. Closer observation of the pre- and post-test results of one-leg stand of both participants suggests that the BP seemed to have a more positive effect on Participant HI experiencing improved balance control. Participant HI improved his balance control in one-leg stand from the effect of BP, unlike his hearing counterpart who was worse off at posttest. However, one needs to recall that Participant Non-HI started off with better balance control than Participant HI. Anecdotal observations also revealed that Participant Non-HI was generally able to have good balance control in one-leg stand without dropping his non-standing leg for support throughout the whole 10 seconds of data collection in this study. These findings seem to infer a higher possibility of positive BP effect on participants with poorer balance pretest result. If not, could participants experiencing performance plateau face unstable movement variability denoted by worse off balance control when they are made to unlearn familiar techniques and relearn specific techniques? Given that this is a case study, further investigation with a larger sample size is warranted.

While the effect of the 6-week BP that uses task-specific approach remains inconclusive, the authors of this study suggest for BP design review to be improved for participants with and without HI. As such, three recommendations are proposed for further investigation in future study. Firstly, the number of practice sessions may not have optimally allowed participants to make significant improvement in all COP parameters and kinetic variables of Balance Tasks especially for those requiring higher balance control ability. Therefore, a further study with more practice sessions will be able to verify it. Secondly, the task-specific approach may not be appropriate for optimal learning effectiveness especially for
participants who have no balance deficits. It is suggested to explore other instructional approaches geared towards activity-based, discovery-based or game-based nature in further studies. Thirdly, in reviewing the balance control of both participants, only information of the pre- and posttest results was available. Assuming if practice sessions were to increase for optimal learning opportunities, it would be good to identify any performance plateau and unstable movement variability (if any) so as to understand the differences in balance control of children with and without HI. With these considerations in mind, it is recommended to increase the number of test sessions (i.e. before BP, within BP & after BP) to investigate the change process of balance control of all participants.

**Conclusion**

Researchers have reported children with HI to have comparatively poorer balance abilities especially in static balance than their normal hearing peers (Campbell, 1983; Gayle & Pohlman, 1990). The findings in this study have reached similar conclusion too. Challenges that children with HI face in motor learning could possibly inhibit timely and appropriate motor strategies to overcome disturbances to balance thus delaying normal motor development. The investigation of the balance control differences between children with and without HI is critical in understanding their motor learning and also introducing alternative movement programme to accommodate both populations’ physical needs in order to align with the notion of inclusion. It is hoped that through balance-focused programmes such as the BP, the children with HI can improve their balance control and in turns help them develop better motor skills; but not forgetting that the children without HI can benefit too.

Inputs from the visual, somatosensory and vestibular systems must be integrated efficiently to activate appropriate motor responses in maintaining optimal balance (Shumway-Cook & Woollacott, 2007). Consequently, it is anticipated that the task-specific practices can provide good opportunities for training children with and without HI to activate their sensory systems to generate appropriate motor responses for better balance control. However, the study has revealed mixed effect of BP on the balance control of both participants. Therefore, the effect of BP that uses task-specific approach on children with and without HI remains inconclusive. Despite the descriptive analysis nature of this study and its inherent limitations with a small sample size, findings from the present case study alert the call to provide support for movement programmes to include children with and without HI.

Based on the recommendations made in this study, it is concluded that the learning of proficient movement patterns requires time and practices to attain optimum motor learning. It is proposed that future studies include an increased number of practice and test sessions in the BP. It is anticipated that the additional practice sessions will allow more time and opportunities for the children with HI to achieve more proficient movement patterns reflecting better balance control. With repeated test sessions introduced within the BP, one can then better understand the change processes of balance control of the children with HI. In addition, a further study of an alternative instructional approach moving towards participant-centered is recommended. Such participant-centered movement programmes may allow practice opportunities for children with HI to self-organise their movement and discover their own preferred balance techniques in order to optimise their ability to attain efficiency in controlling balance.

**References**


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Appendix A

Balance Programme (BP) Activity Plan

<table>
<thead>
<tr>
<th>Descriptions</th>
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<tbody>
<tr>
<td><strong>Warm up</strong></td>
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</tbody>
</table>
| Duration: 5 minutes  
Purpose: increase heartbeat, warm up body temperature, stretch to increase body flexibility  |
| Activities:  |
| ✓ Arm swings  
✓ Leg Swings  
✓ Back stretch  
✓ Hamstring stretch  
✓ Quadriceps stretch  
✓ Jogging on the spot  |

<table>
<thead>
<tr>
<th>Task-specific Activities</th>
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</table>
| 1. Task-specific movement activities  
Purpose: task specific approach applied to teaching the balance tasks with continuous monitoring and immediate feedback  |
| 2. Related-movement activities (use of wall as support, beanbags, gym rings & jump ropes)  
Purpose: enhance kinesthetic awareness, avoid boredom by increasing variations, practice on balance tasks that are weaker  |
| Duration: 35 minutes (about 25-minute of static balance tasks & about 10-minute of dynamic balance tasks)  |
| Activities:  |
| ✓ Static balance tasks (two-leg stand & one-leg stand) and related static balance tasks are carried out in blocks of 30 seconds x 3 trials per task  
✓ Dynamic balance tasks (jump & hop) and related dynamic balance tasks are carried out in blocks of 10 seconds x 3 trials per task  
✓ Rest intervals of about 10 seconds and 30 seconds are given for every trial and task respectively before moving on to the next activity  
✓ Details of each session flow is indicated below  |

<table>
<thead>
<tr>
<th>Session 1</th>
<th>Session 2</th>
<th>Session 3</th>
<th>Session 4</th>
<th>Session 5</th>
<th>Session 6</th>
</tr>
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<tbody>
<tr>
<td>Two-leg stand (eye open)</td>
<td>Two-leg stand with gym ring placed on head (eye open)</td>
<td>Two-leg stand (eye open)</td>
<td>Two-leg stand (eye open)</td>
<td>Two-leg stand (eye open)</td>
<td>Two-leg stand (eye open)</td>
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<tr>
<td>Two-leg stand (eye closed)</td>
<td>Two-leg stand with beanbag placed on head (eye closed)</td>
<td>Two-leg stand (eye closed)</td>
<td>Two-leg stand (eye closed)</td>
<td>Two-leg stand (eye closed)</td>
<td>Two-leg stand (eye closed)</td>
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<tr>
<td>Two-leg stand with beanbag placed on head (eye closed)</td>
<td>Two-leg stand with gym ring placed on head (eye closed)</td>
<td>Two-leg stand with beanbag placed on head (eye closed)</td>
<td>Two-leg stand with beanbag placed on head (eye closed)</td>
<td>One-leg stand on preferred side (eye open)</td>
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<tr>
<td>One-leg stand on preferred side with wall support (eye open)</td>
<td>One-leg stand on preferred side (eye open)</td>
<td>One-leg stand on preferred side (eye open)</td>
<td>One-leg stand on preferred side with beanbag placed on head (eye open)</td>
<td>One-leg stand on preferred side with gym ring placed on head (eye open)</td>
<td></td>
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<tr>
<td>One-leg stand on preferred side (eye open)</td>
<td>One-leg stand on non-preferred side (eye open)</td>
<td>One-leg stand on non-preferred side (eye open)</td>
<td>One-leg stand on non-preferred side (eye open)</td>
<td>One-leg stand on non-preferred side (eye open)</td>
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<tr>
<td>One-leg stand on non-preferred side with wall support (eye open)</td>
<td>One-leg stand on preferred side with wall support (eye closed)</td>
<td>One-leg stand on non-preferred side with wall support (eye closed)</td>
<td>One-leg stand on non-preferred side with beanbag placed on head (eye open)</td>
<td>One-leg stand on non-preferred side with gym ring placed on head (eye open)</td>
<td></td>
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<tr>
<td>Jump with rope turns</td>
<td>Jump</td>
<td>Jump</td>
<td>Jump with rope turns</td>
<td>Jump with rope turns</td>
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<tr>
<td>Jump</td>
<td>Hop on preferred side with rope turns</td>
<td>Hop on preferred side with rope turns</td>
<td>Hop on preferred side with rope turns</td>
<td>Jump</td>
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<tr>
<td>Hop on preferred side with rope turns</td>
<td>Hop on non-preferred side with rope turns</td>
<td>Hop on non-preferred side with rope turns</td>
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<td>Hop on non-preferred side with rope turns</td>
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**Cool down**

Duration: 5 minutes
Purpose: decrease heartbeat, cool down the body temperature, stretching to increase flexibility

Activities:
- Back stretch
- Hamstring stretch
- Quadriceps stretch
- Breathing exercises
THE TAPED PROBLEMS INTERVENTION:
INCREASING THE MATH FACT FLUENCY OF A STUDENT WITH AN INTELLECTUAL DISABILITY

Elizabeth McCallum
Ara J. Schmitt
Duquesne University

The Taped Problems intervention is an evidence-based practice that involves a self-monitored, audio-recording procedure in which students follow along with automated recordings of math facts and their solutions. A multiple-probes-across-tasks design was used to evaluate the effectiveness of the Taped Problems intervention on the division-fact fluency of an eighth-grade student with an intellectual disability. Results indicated immediate and sustained increases in the student’s division-fact fluency across sets of problems. Discussion focuses on the practical implications of the results, limitations of the current investigation, and directions for future studies.

Although general and special education teachers devote much instructional time to teaching mathematics, the 2009 Nation’s Report Card indicates that only 39 percent of fourth-grade students and 34 percent of eighth-grade students are performing at or above the level of proficiency in mathematics (NCES, 2009). Relevant to the current study, only 19 percent of fourth-grade students with disabilities and nine percent of eighth-grade students with disabilities are performing at or above this level (NCES, 2009). These data indicate that as the grades progress, an increasing number of students eligible for special education fail to meet grade-level curricular expectations in math. As such, efficient interventions are needed to prevent and/or remedy basic math skill deficits, particularly among students with disabilities.

Basic math facts (one-digit by one-digit addition, subtraction, multiplication, and division computations) are the most fundamental computational skill for all higher math tasks. Research has historically focused on math fact acquisition, or teaching strategies and procedures for correctly solving these basic math computations (Poncy, Skinner, & Jaspers, 2007). Acquisition strategies such as number lines, manipulatives, and finger counting procedures have value because they can be applied across contexts and may lead to higher conceptual understanding of mathematics (Poncy, Skinner, & O’Mara, 2006). Although these procedures have merit, there are also limitations associated with the use of such acquisition strategies (Pellegrino & Goldman, 1987). Many of these strategies are time-consuming (e.g., those that involve manipulatives and finger counting) and students may become dependent upon these laborious techniques for solving problems. Additionally, when a strategy requires several steps, a single mistake may prevent a student from arriving at a correct answer that otherwise could be automatically retrieved.

The limitations associated with complex procedures to teach the acquisition of basic math facts, have led to increasing interest in strategies that build math fact fluency. Recently, researchers have begun to argue that students should not only be able to respond accurately to math problems, but also be able to respond quickly and with little effort (Poncy, Skinner, & Jaspers, 2007). Haring and Eaton (1978) referred to fast and accurate responding as fluency. Math fact fluency is important for a variety of reasons. Cognitive processing theory suggests that individuals have a limited amount of cognitive resources (working memory, attention) to devote to any given task (Laberge & Samuels, 1974; Pellegrino & Goldman, 1987). When faced with a complex math task, a student who is fluent with respect to math facts has more cognitive resources to devote towards finding a solution to the problem. A dysfluent student must divert cognitive resources away from the complex components of the problem and towards lower level skills like solving the math facts (Delazer et al., 2003; LaBerge & Samuels, 1974).
Math fact fluency is also important from the standpoint of behavioral learning theory. Much behavioral research has demonstrated the importance of opportunities for active responding for enhanced academic performance (Skinner, Belfiore, Mace, Williams, & Johns, 1997; Skinner, Pappas, & Davis, 2005). First, students who fluently complete math facts are presumably able to complete more math problems within a given time frame. These increased opportunities to respond also result in additional occasions for reinforcement for correct responses. Additionally, research has demonstrated that students who are fluent with math facts are less likely to suffer from math related anxiety (Cates & Rhymer, 2003). Finally, data is present to suggest that fluent students are more likely to choose to engage in assigned math tasks than dysfluent students (Billington, Skinner, & Cruchon, 2004). In brief, the positive choices often made by fluent students lead to more opportunities for practice, more reinforcement, and less math anxiety, all factors contributing to higher performance relative to dysfluent students.

Although math fact accuracy and fluency are typically part of the elementary school curriculum, the overwhelming majority of middle- and high-school students with disabilities have not mastered these skills (NCES, 2009). This is problematic as individuals with math fact deficiencies may be excluded from certain vocational and career paths (Sante, McLaughlin, & Weber, 2001). Because of this risk, interventions are needed to increase the math performance of students with disabilities.

One evidence-based intervention that has been used to efficiently increase the math fact fluency of elementary and secondary students with and without disabilities is the Taped Problems intervention (TP). This intervention involves listening to audio recordings of math facts followed by brief pauses and then the answers to the math facts. Students are provided follow-along worksheets and instructed to try to beat the recording by writing the solution to each math fact before hearing the correct answer spoken on the recording. If a student fails to answer a problem within the provided time delay, or answers a problem incorrectly, she writes the correct answer upon hearing it on the recording. Incorporated within TP are (a) numerous opportunities for accurate responding, (b) reinforcement for correct responding, and (c) immediate feedback on responses (whether correct or incorrect). The combination of these three factors is thought to contribute to the effectiveness of the TP intervention.

The TP intervention was first used to increase the division fact fluency of an elementary student with a math disability (McCallum, Skinner, & Hutchins, 2004). Subsequently, TP has proven to be effective across populations of students (special education and general education) and contexts (individual and class-wide) (Carroll, Skinner, Turner, McCallum, & Woodland, 2006; McCallum, Schmitt, Schneider, Rezzetano, & Skinner, 2010; McCallum, Skinner, Turner, & Saeckar, 2006; Poncy, Skinner, & Jaspers, 2007). To date, all empirical TP studies have evaluated the intervention using single subject research designs. Although sometimes confused with qualitative case study research approaches, single subject designs differ as they are quantitative experimental research methods in which each participant serves as his or her own control (Sidman, 1960). Additionally, in single subject research, each participant is exposed to a control condition (known as the baseline phase), as well as an intervention condition in which the dependent variable is repeatedly measured while controlling for common threats to internal validity. Across disciplines, single subject research has been used to evaluate the effectiveness of enumerable educational interventions (e.g., Barlow & Hersen, 1984; Skinner, 2004; Horner et al, 2005).

The purpose of the current study was to add to the TP evidence base by evaluating the effectiveness of a self-monitored TP procedure for increasing the division fact fluency of an eighth-grade student with an intellectual disability. Improving the math skills of students with intellectual disabilities is not only essential for future mathematics instruction, but also to promote the development of adaptive behavior skills like number concepts, time, and money (American Association of Intellectual and Developmental Disabilities; AAIDD, 2010).

**Method**

**Participant and Setting**

Emily was a 13 year old, 8th grade student educated within a public middle school in the Northeastern United States. She received special education services as a student with an intellectual disability. This disability was reported to have resulted from a cerebrovascular accident (stroke) at birth. In addition to services provided within a self-contained, life skills classroom, she also received speech, occupational, and physical therapies. Most recent psycho-educational evaluation data revealed that Emily earned an FSIQ of 59 and an adaptive behavior composite of 70. After learning of the TP intervention through an educational consultation with this study’s investigators, her teacher reported that Emily may benefit from
this math fluency intervention as she learned rote academic tasks (e.g., spelling) more easily than academic tasks that required reasoning (e.g., reading comprehension, math reasoning, and written expression). The study’s procedures were implemented within Emily’s self-contained classroom. Other students were present and working on other assignments as she participated in the intervention. Emily sat to the back of the room and wore headphones in order to not distract her classmates, and to help focus her attention.

**Materials**

Emily’s TP intervention procedures concerned division math facts. As such, basic division facts with quotients (answers) of two through nine were separated into three distinct sets of problems (see Appendix A). Problems with a quotient of 1 (e.g., 6 ÷ 6), problems that involved a 0 (e.g., 0 ÷ 4), and inversion facts (i.e., 14 ÷ 2 or 14 ÷ 7, but not both), were excluded from the problem sets. Baseline and intervention outcome data were collected using these three sets of experimenter constructed division fact probes. The order of division problems within each probe was randomly assigned. For purposes of the intervention, three CD tracks, one for each problem set, were created using voice recording computer software. A track consisted of an experimenter a reading problem set that corresponded to an intervention worksheet. Specifically, the item number of each problem was read, and then the division fact was read at a rate of one utterance per second (e.g., *6… divided by … 2… equals*). After the problem was read, a two second delay was present before the answer was provided. Each answer was in turn followed by a brief delay before the next item number was read. A track and corresponding worksheet was comprised of four repetitions of the problem set in randomized order. The intervention worksheets contained every problem on the corresponding CD track and a space to write each answer. In sum, a CD player, problem set CD tracks and corresponding intervention worksheets, headpones, assessment probes, a stopwatch, and a pencil were required to implement this study.

**Experimental Design and Procedures**

A multiple-probes-across-tasks (multiple baselines) design was used to evaluate intervention outcomes (Cuvo, 1979; Horner & Baer, 1978). This study used digits correct per two minutes (DC2M) by way of two minute assessment probes as the dependent variable. Each item on an assessment probe was worth only one digit correct as the answer for each problem ranged from two to nine (Deno & Mirkin, 1977). Therefore, the sum of all correctly answered problems within the two minute period of each assessment probe resulted in the DC2M score for that probe.

**Assessment procedures.** Assessment procedures were completed for each problem set for each of the initial four sessions (baseline phase). This was to obtain baseline data regarding all three problem sets. A stopwatch was used to time each of Emily’s randomly ordered problem set assessment probes. She was directed to complete as many division problems as she could in two minutes, and when time was up, Emily was instructed to put her pencil down and wait for the next assessment probe (see Appendix C for assessment and intervention instructional scripts). At no point in the study’s assessment procedures was Emily provided performance feedback. After the completion of the four baseline assessment sessions, the intervention procedures were initiated with Problem Set A. Before beginning an individual intervention session that targeted a specific set of problems, an assessment probe for that set of problems was administered. This data from the assessment probe prior to the daily intervention session constituted the dependent variable in this study. Problem sets not targeted by the intervention were sporadically probed. Maintenance data were collected using the procedures of the first three baseline sessions. The final two sessions (sessions 18 and 19) were collected one and two weeks following the final intervention session (session 17) respectively. This procedure was intended to determine whether effects were maintained over time.

**Taped problems intervention procedures.** After the initial baseline sessions, the first intervention session was implemented using Problem Set A. The following intervention procedures were used across problem sets and sessions. For each intervention session, the experimenter placed a problem set intervention packet face down on Emily’s desk. The packet was comprised of division math fact problems that were numbered in the order of the problems provided on the corresponding CD track (see Appendix B for an example intervention worksheet). Emily was told that she would complete math problems while listening to a CD. She was instructed to follow along with the CD as it would read problems that matched her worksheets and also provide correct answers. Emily was directed to write her answer in the space provided on the worksheet after the problem was read, before the answer was provided. Hence, she was encouraged to try to *beat the recording* by writing each answer before hearing it on the CD. If she
incorrectly answered a problem, she was told to cross out the incorrect answer and write the correct answer provided by the CD (see Appendix C for instructional scripts). After the experimenter confirmed that Emily understood the intervention procedures each session, Emily placed headphones over her ears and pressed play on the CD player. When the CD was finished, she removed her headphones and the problem set intervention packet was collected.

_Treatment integrity and interscorer agreement._ Treatment integrity data were collected by a second experimenter during three of the ten intervention sessions (30%) using a treatment integrity checklist. The checklist included procedural steps such as: researcher placed problem set intervention packet upside down in front of the student, researcher read intervention directions verbatim, researcher instructed the student to turn over the packet, student pressed play on the CD player, etc. One hundred percent integrity was achieved. Interscorer agreement data were also obtained by having a second experimenter score 7 of the 35 assessment probes (20%) across baseline, intervention, and maintenance phases. Interscorer agreement regarding digits correct per two minutes (DC2M) across these assessment probes was 100%.

**Results**

Emily’s DC2M performance across phases and sets of problems is displayed in Figure 1. Regarding baseline Set A, visual analysis reveals an increasing trend in performance across sessions one through four with the largest increase occurring between sessions one and two. However, a slight decreasing trend is present between baseline sessions four and five. Visual analysis of baseline data for Set B reveals a large increase in performance between sessions one and two, and a small increase in baseline performance thereafter. Baseline performance in Set C increased across sessions one through three, but no further improvement in Set C baseline scores manifested through session six.

Data included in the intervention phase reflects DC2M assessment scores obtained at the start of the next intervention session (delayed assessment), but before the next session’s treatment was applied. A rise in DC2M delayed assessment data the session following the application of the TP intervention is present across problem sets. Figure 1 reveals seeming treatment inertia across sets when one considers change in performance across sets between the last baseline data point and the first delayed intervention assessment score (initial baseline-intervention latency period). For example, the difference in this performance measure is 3, 9, and 20 DC2M for Sets A, B, and C, respectively. Furthermore, increasing trends in performance are present during the intervention phase across sets of problems.

**Maintenance of Treatment Effects**

Intervention maintenance data are also presented in Figure 1. Visual analysis of problem Sets A, B, and C reveal sustained DC2M performance compared to the intervention phase and improved performance judged against baseline across problem sets. Maintenance phase data for Sets A and B also reveal increasing trends in division fact fluency. Furthermore, between baseline and intervention/maintenance phases for any given problem set, there is zero percent of non-overlapping data. All baseline data points for a problem set are below all intervention and maintenance data points for that set. The existence of non-overlapping data is a further indication of significant improvements of DC2M across problem sets (Daly, Chafouleas, & Skinner, 2005).

**Treatment Acceptability Outcomes**

Student and teacher acceptability data were obtained following the last intervention session. A student acceptability form (elementary readability) was read to Emily and she checked either Yes, Maybe, or No for each item. Emily indicated the TP intervention was fun, her division math fact speed and accuracy improved, and that others would like to learn math using the intervention. Her teacher also assigned favorable rating for the intervention. Overall, her teacher found the intervention to be an acceptable intervention for future use and would recommend it to others. The intervention was viewed as a time-efficient means to improve the math fact fluency of students with intellectual and developmental disabilities with no discernable negative side-effects.
Discussion
The TP intervention is an easily implemented, low-tech intervention for increasing math fact fluency. The current study adds to the TP literature supporting the procedure for use with students with intellectual disabilities. Results of this study demonstrated that across problem sets, the math fact fluency of a student with an intellectual disability increased immediately after the introduction of the intervention and was sustained following the removal of the intervention procedures. Furthermore, this study suggests that TP procedures can be self-monitored by students at learning centers.

Figure 1 depicts an increasing trend not only within problem sets but also across problem sets. As the study procedures progressed, Emily’s response to the intervention was more pronounced. Following the first baseline phase (Set A), Emily’s DC2M increased at a much less steep rate than following the introduction of the intervention to Sets B and C. A dramatic fluency increase is evidenced between the last baseline point in Set C (session 13) and the first intervention point in Set C (session 14). A possible
explanation for this across problem set’s trend involves Emily’s increasing familiarity with the TP procedures. Perhaps as the study went on, Emily became more accustomed to the procedures and was better able to focus on the elements crucial for success (answering the math facts quickly and accurately).

Given the immediate growth and sustained math fact fluency following the implementation of the intervention across problem sets, the practical implications of the current study are numerous. Math fact fluency is of importance for students with and without intellectual disabilities as their career and vocational experiences may require this skill (AAIDD, 2010). Therefore, this intervention may be used in an attempt to quickly remedy a student’s basic math skill deficit when identified as a transition need. Additionally, the TP intervention is designed so that it can be tailored to the particular needs of a student or group of students. This study demonstrated that the TP procedures can be customized to the specific needs of a student with a significant disability. Furthermore, little teacher involvement is required beyond setting up and providing the materials. The current procedures were self-monitored by Emily as she wore headphones at a learning center in the back of the classroom. As most resource classrooms are comprised of students involved in various levels of academic skills, a self-monitored procedure may be particularly useful.

One limitation of the current study is that DC2M for problem Set A were increasing during the baseline phase. This limits the ability of the data to demonstrate a functional relationship between the intervention and DC2M for this problem set. It is unknown whether the increasing trend for Set A would have continued even without the introduction of the intervention. However, the clear demonstration of the experimental effect of the TP intervention on DC2M in problem Sets B and C offset this limitation to some degree. Additionally, the lack of overlapping data points between the baseline phase and intervention/maintenance phases across all three problem sets further supports the effectiveness of the intervention.

Another limitation of this investigation involves the generalizability of the current results. Because the study included only one student, the external validity of the positive results is limited. Unknown is if similar findings would occur after implementing the TP intervention with other students with intellectual disabilities. Future research should address the impact of the TP intervention on additional students with intellectual disabilities. As indicated earlier, Emily’s intellectual disability stemmed from a cerebrovascular accident at birth. Although Emily responded well to the TP intervention, the response of students with intellectual disabilities of varying etiology is presently unknown. Given the origin of Emily’s disability, it is plausible that some neuropsychological functions may have been spared and resulted in her ability to remarkably respond to the current procedures. In fact, Emily’s teacher did report that one of Emily’s strengths was rote learning, a skill involved in TP procedures. Future researchers might also consider response to TP procedures against unique patterns of neuropsychological functioning.

The TP procedure involves a variety of components that may account for its effectiveness in improving math fact fluency. These components include numerous opportunities for accurate, academic responding, immediate feedback on accuracy of responses, and reinforcement for correct responses. Future research is needed to determine which components of the TP procedures led to the demonstrated fluency gains.

The current study is a replication of previous TP intervention procedures in which a student with an intellectual disability self-monitored the procedures, resulting in immediate and sustained division fact fluency gains. (Carroll et al., 2006) This study provides further support for the TP procedure as a time- and resource-efficient method of improving math fact fluency that can be used with students across settings and populations.

References
Appendix A

The Three Problem Sets

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<thead>
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Appendix B

TP Assessment Probe Script

When you get your sheet, write your name at the top and then look up at me to let me know you’re ready. **DO NOT START THE PROBLEMS UNTIL I TELL YOU TO.**

When I say Go, write your answer to the first problem (point to the first problem) and keep working until I say Stop. Try to work each problem. If you come to one you really don't know, put an X through it and go to the next one. If you finish the first side, turn it over and continue working. Are there any questions? Go.

At the end of 2 minutes: **Stop. Put your pencil down.**

TP Intervention Worksheet Script

You will be listening to some math problems on this CD with your headphones. Follow along on your worksheet going across the page and try to beat the CD by writing the answer to each problem before you hear it on the CD. If you miss a problem or can’t think of the answer, write the correct answer when you hear it on the CD. Do your best and STAY WITH THE CD. If you need help, raise your hand and I will come help you. Are there any questions?
### Appendix C
Sample TP Intervention Worksheet (page 1)

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YOU KNOW, EUNICE, THE WORLD WILL NEVER BE THE SAME AFTER THIS

Chandra J. Foote
Niagara University

Bill Collins
Special Olympics New York

Over the past few decades Special Olympics has been criticized within the academic community for failing to provide inclusive recreational services, reinforcing negative stereotypes, misusing volunteers, and lacking research demonstrating positive impacts for individuals with intellectual disabilities and the larger community (Hourcade, 1989; Storey 2004, 2008). Following the recent passing of Eunice Kennedy Shriver on August 11, 2009 and her husband, R. Sargent Shriver on January 18, 2011, it seems timely to respond to these critics in defense of Special Olympics and the tremendous accomplishments of the Shriver. This article presents a brief history of the Special Olympics (SO) movement; summarizes the concerns presented in the literature about the organization; highlights the mission and offerings; and presents counter points in defense of its programs. Within the article we advocate that the impact of Special Olympics on the lives of individuals with significant developmental disabilities far surpasses that of any other organization in the world, and SO’s potential for future success is certain should the mission and goals remain so strongly focused. As former Chicago Mayor Richard Daley eloquently stated on the opening day of the first International Special Olympic Games in 1968 You know, Eunice, the world will never be the same after this.

Special Olympics is an international organization dedicated to providing year-round sports training and athletic competition in a variety of sports for children and adults with intellectual disabilities. Founded by Eunice Kennedy Shriver in 1968, Special Olympics was grounded in her belief that people with developmental disabilities were far more capable than most people assumed, and deserved equal opportunities to demonstrate these capabilities. Today the organization provides programming for 3.3 million children and adults with intellectual disabilities in 30 Olympic-type sports, hosting 32,000 competitions around the world each year (Special Olympics, 2010a).

Over the past few decades Special Olympics has been criticized within the academic community for failing to provide inclusive recreational services, reinforcing negative stereotypes, misusing volunteers, and lacking research demonstrating positive impacts for individuals with intellectual disabilities and the larger community (Hourcade, 1989; Storey 2004, 2008). Following the recent passing of Eunice Kennedy Shriver August 11, 2009 and her husband, R. Sargent Shriver on January 18, 2011, it seems timely to respond to these critics in defense of Special Olympics and the tremendous accomplishments of the Shriver. This article presents a brief history of the Special Olympics (SO) movement; summarizes the concerns presented in the literature about the program; highlights the mission and program offerings; and presents counter points in defense of their programs. As former Chicago Mayor Richard Daley eloquently stated on the opening day of the first International Special Olympic Games in 1968 You know, Eunice, the world will never be the same after this.

A Brief History Eunice Kennedy Shriver and Special Olympics
The Special Olympics movement originally began as a day camp for individuals with disabilities started by Eunice Kennedy Shriver at her home in Rockville, Maryland in 1962. The inaugural camp included 35 children exploring a variety of sports and physical activities. Kennedy Shriver understood from the
outset that the young people she invited to her home had many capabilities that were not being recognized and celebrated. Camp Shriver became an annual event and between 1963 and 1968 expanded to more than 300 similar camps across the United States.

In response to outreach from the Chicago Park District to identify ways to increase services for people with intellectual disabilities, Eunice Kennedy Shriver harnessed the power of the Kennedy Foundation to plan and fund the first international Special Olympics Games in Chicago’s Soldier Field, on July 20, 1968. Over 1000 athletes participated in track, floor hockey, and aquatics sports at the first Games. In her Opening Ceremonies address Mrs. Kennedy Shriver emphasized the fact that exceptional children...can be exceptional athletes, the fact that through sports they can realize their potential for growth (Special Olympics, 2010b, para. 8).

In 1977 Special Olympics expanded to include Winter Games with events in skiing and skating at Steamboat Springs, Colorado. Later Kennedy Shriver, with the help of her husband R. Sargent Shriver, gained approval and endorsement from the U.S. and International Olympic Committees for full recognition of Special Olympics and the authorization to use the name Olympics. Over the next few decades Special Olympics established programs in the Far East, Middle East and the countries of the former Soviet Union with R. Sargent Shriver serving as President beginning in 1984 and Chairman of the International Board of Directors beginning in 1990. Internationally, there are now over 226 Special Olympics programs involving 3.3 million athletes (Special Olympics, 2010a).

On August 11, 2009, Mrs. Kennedy Shriver passed away and a statement from the Shriver family to her Special Olympics family in part reads: ...it was her unconditional love for the athletes of Special Olympics that so fulfilled her life. As Thomas Merton, the Trappist monk and social activist reminded us: the beginning of love is to let those we love be perfectly themselves, and not to twist them to fit our own image, lest we love only the reflection of ourselves we find in them.

Her love for the athletes of Special Olympics was always just like that. She never hoped that people with intellectual disabilities should be somehow changed into something they were not. Rather, she fought throughout her life to ensure that they would be allowed to reach their full potential so that we might in turn be changed by them, forced to recognize our own false assumptions and their inherent gifts.

She fought the good fight, she kept the faith, and though she knew the race for equality was not finished, she knew that the army of supporters she had hoped for long ago had become a reality that would carry and someday complete her vision. ... (Shriver, 2010, para. 9-11).

Fully recognizing that society still holds tremendous misconceptions about the capabilities of individuals with intellectual disability, Eunice Kennedy Shriver and her husband R. Sargent Shriver established a legacy in a movement that will continue to change lives and attitudes for years to come.

Criticisms of Special Olympics
A number of scholars have suggested that rather than increasing the quality of life of its athletes, Special Olympics has limited their potential because of the segregated focus of programs and offerings (Hourcadde, 1989; Storey 2004, 2008). Storey argues You can participate only if you have a disability, and as such, you have the major problem facing the program (2008, p.135). Storey, in fact, directly advocates for the discontinuation of Special Olympics in favor of developing more inclusive recreational programs. The scholarly literature on integrated recreational services suggests that these programs should offer opportunities for individuals with cognitive disabilities that include regular interactions with individuals without disabilities (Will, 1984), and these services should be designed such that persons with disabilities might enjoy them to the same degree as persons without disabilities (Mank & Buckely, 1989).

An additional criticism of Special Olympics is that it reinforces the negative stereotypes commonly held toward people with significant learning difficulties. Evidence for this argument is illustrated in media accounts of Special Olympic events wherein athletes are often referred to as mentally retarded, handicapped, or suffering from a disability. Adding insult to this inappropriate terminology are the comments of famous and highly regarded individuals who, perhaps unintentionally, deride the program with off-the-cuff remarks. One prominent example is the recent comment by President Barak Obama
(March 19, 2009) on the Jay Leno show in which he described his bowling skills as ... like the Special Olympics or something. A number of scholars have explored the nature of language as it is used to describe undervalued groups. In general, these descriptive labels serve to demean individuals with disabilities, distance them from the larger society, disregard individual differences, and focus attention only on a single aspect or trait of an individual from this group (Eayrs, Ellis, & Junes, 1993; Smart, 2001; Wolfensberger, 1995).

Closely aligned with this criticism is the concern that Special Olympics often host competitions in which children and adults participate at the same event. Storey (2008) suggests that this results in a loss of dignity when adults are denied their age-appropriate status. Storey further emphasizes this issue with examples from the media in which adult athletes are described as children or kids, and descriptions of recreational areas at competitions that include juvenile activities such as clown toss, ring toss, and golf with plastic clubs and balls (2008, p. 136). In effect, these criticisms suggest that Special Olympics promote demeaning perspectives of the broader society toward individuals with severe disabilities.

Special Olympics has also been criticized for the way that it utilizes volunteers, and the missed opportunities for developing quality relationships between individuals with and without intellectual disabilities. Much has been made of the use of huggers at competitive events. Volunteers, who participate in Special Olympics on a cursory level, only on the day of a competition, are often assigned the role of cheering on athletes, congratulating them following an event, and awarding medals. These activities fall within the hugger level of involvement with Special Olympics. The literature suggests that individuals with intellectual disabilities often display inappropriate social behaviors including violating social space, touching, etc. (Carter & Hughes, 2007). Storey (2008) chastises Special Olympics not only for reinforcing the infantilization of adults through hugging, but for directly interfering with their social skills development by requesting volunteers model inappropriate touching of strangers.

Volunteers who have more direct and sustained interactions with Special Olympic athletes such as coaches, event organizers, and board members are criticized for establishing subservient, paternalistic relationships. Storey (2008) cites the dominant role inherent in the coach and player relationship, and lack of leadership roles for individuals with developmental disabilities within the organization. Advocates for the development of lasting relationships between adults with and without disabilities suggest that interactions should be frequent, have a high probability of future exposure, and be of equal status (Chadsely, 2007). According to this definition, Special Olympics volunteers are unlikely to form lasting relationships with program athletes.

Other criticisms of Special Olympics including the functional value of certain events and the financial dealings of the organization have been adequately addressed elsewhere (Hughes & McDonald, 2008; MacLean, 2008), leaving one final concern regarding research on the impact of Special Olympic on the lives of athletes and the larger community. Storey (2008) presents several studies that suggest that Special Olympics, at best is as effective as integrated recreational programs in improving the quality of life of individuals with disabilities, and at worst promotes even more negative attitudes in the larger community. In effect, the concern is that there is no evidence of the effectiveness of Special Olympics.

The Nature and Scope of Special Olympics
In order to respond to criticisms against Special Olympics it is first helpful to understand the nature and scope of the movement as defined by its mission, goals, and programs. As articulated in the official SO website, the mission of Special Olympics is to

provide year-round sports training and athletic competition in a variety of Olympic-type sports for children and adults with intellectual disabilities, giving them continuing opportunities to develop physical fitness, demonstrate courage, experience joy and participate in a sharing of gifts, skills and friendship with their families, other Special Olympics athletes and the community (Special Olympics, 2010c).

The philosophy of Special Olympics is:

that people with intellectual disabilities can, with proper instruction and encouragement, learn, enjoy and benefit from participation in individual and team sports. Special Olympics believes that consistent training is essential to the development of sports skills, and that competition among those of equal abilities is the most appropriate means of testing these skills, measuring progress and providing incentives for personal growth. Special Olympics believes that through
sports training and competition, people with intellectual disabilities benefit physically, mentally, socially and spiritually; families are strengthened; and the community at large, both through participation and observation, is united in understanding people with intellectual disabilities in an environment of equality, respect and acceptance (Special Olympics, 2010d).

Special Olympics outlines 11 guiding principles the first of which is: to help bring all persons with intellectual disabilities into the larger society under conditions whereby they are accepted, respected and given a chance to become productive citizens (Special Olympics, 2010d).

In addition to providing specific sport training and competition, Special Olympics offers a number of other programs focused on integrating sports, developing leadership skills among athletes, promoting the health and well-being of individuals with intellectual disabilities, and improving the perceptions of larger society about the capabilities of this population.

Integrated Sports Programs
The Unified Sports program developed over 20 years ago was designed to include equal numbers of athletes with and without intellectual disabilities on sports teams. This effort has grown to include 150,000 participants in basketball, track and field, soccer, and golf (MacLean, 2008).

Leadership Programs
The Athlete Leadership and Global Messenger programs are designed to help athletes explore new opportunities as coaches, officials, public speakers, and board members. These programs assist athletes to become advocates for themselves and their peers and develop skills that lead to more independent living. As a result, there are more athletes serving in leadership roles within the organization (Special Olympics, 2010e).

Health Promotion Programs
Special Olympics has become the largest world health organization serving individuals with intellectual disabilities. Under the auspices of the Healthy Athlete program Special Olympics enlists health care volunteers to provide medical screenings and health promotion workshops at competitions. Sports physicals, audiology and vision exams, dentistry, and physical therapy are provided to athletes through this program. Volunteers gather information about the health care needs of individuals with disabilities and train medical professionals about their appropriate care (Special Olympics, 2010f).

School-based Educational Materials
The SO Get Into Program provides curriculum resource kits to primary grade teachers of students with and without disabilities. The program learning goals include helping students to understand, accept, and celebrate individual differences. The activities and resources in the Get Into It kit are provided to teachers free of charge through local Special Olympics programs and will soon be available on the Special Olympics website.

Language/Terminology Programs
The Special Olympics website offers disability language guidelines that help to inform the media and larger community about the impact of the words they use to describe individuals with disabilities. These guidelines include recommendations for person-first, politically correct, and age-appropriate language. In addition, Special Olympics has organized a campaign to stop the use of the word retard. Thousands of individuals and over 200 organizations have joined this movement by pledging their support at http://r-word.org/.

In sum, Special Olympics uses sport and competition as a vehicle to first allow its athletes to change their views of themselves, and second to change the community’s understanding and perceptions of people with disabilities. Through SO programming, athletes begin to view themselves as successful, and they begin to learn lessons that carry over into their lives as active participants in the community. Athletes begin to see themselves as individuals worthy of appreciation, and as the larger community witnesses their joy and success they also develop an appreciation and respect for the athletes as people with tenacity and ability. As the President and CEO of Special Olympics New York, Neal Johnson is fond of saying How can you see an athlete lift 300 pounds over his head and say he’s disabled?
In Defense of Special Olympics
The primary concern with Special Olympics is that its programs promote the segregation, and therefore marginalization, of individuals with intellectual disabilities. As noted above, the philosophy and guiding principles of the organization directly contradict this concern with the goal to bring individuals with intellectual disabilities into the broader society under conditions that promote acceptance, respect, and opportunities to become productive citizens. The mission of the organization, however, is not centered on inclusion; it is focused on providing opportunities for sports training and competition for individuals with intellectual disabilities.

These opportunities are becoming more exclusive throughout our society. Young children are tracked for travel teams by age eight. Students who can’t compete on the high school junior varsity or varsity team have very limited opportunities to compete elsewhere, and by the time they enter young adulthood, if they are still interested in playing after years of being unsuccessful competitors, there are very few opportunities for them to develop their skills.

Furthermore, there are many anecdotal accounts of youth with disabilities serving as ball boys, team managers, and mascots. These youth may have more skill or potential than the athletes who make the team, yet they are assigned to menial tasks associated with the team perhaps because coaches don’t know how to support their individual needs despite their skills and talents. Although often heralded as miracles, inclusion advocates should find tragic the sensational stories of team managers with disabilities finally playing in a single game in their final season and scoring points they could have been scoring over multiple seasons (Dehs, 2006).

Special Olympics recognize that these opportunities are significantly limited for all populations, and endeavors to change this situation for individuals with intellectual disabilities. In effect, Special Olympics never set itself up as an organization solely focused on integration and it has remained true to its mission from the start. Although some aspects of life such as school and work have high expectations for integration, others are social choices. Individuals select their own religious affiliation, community organizations, hobbies, and past times. Many of these choices are in themselves segregated, either by design or self-selection, to an even larger degree than Special Olympics. Girl scouts, for example, is an organization dedicated to developing opportunities for young females to function independently in an inclusive world. This organization however is not in itself inclusive. Because Special Olympics is one choice among a very few for individuals with intellectual disabilities the organization is criticized even though it endeavors to promote inclusion in the larger society.

Individuals with intellectual disabilities should not limit themselves to recreation and leisure activities that are segregated in nature, but when there are very limited options, they should not be prevented from participating in an activity they choose. Special Olympics coaches are trained to explore the sport-specific integrated opportunities in their neighborhoods and educate athletes about these options. Coaches are also trained to honor the choices and wishes of the athletes themselves regarding participation in inclusive recreational activities. Although others have criticized Special Olympics for not promoting integrated programming at all costs, the organization recognizes that the athlete’s choice is the most important decision-making factor.

Special Olympics is among the most inclusive sporting organizations when it comes to implementation. Unlike most athletic competitions, there is no admission charge for SO events and athletes are never charged for their participation. Special Olympics make use of facilities that are typically enjoyed by the larger community enabling athletes to come into contact with individuals they may not typically be exposed.

Although Special Olympics was not specifically designed to meet the needs of individuals without intellectual disabilities it does welcome their participation at all levels. Evidence of this inclusive and welcoming nature can be seen in the existence of Unified Sports programs for over two decades. Hughes and McDonald (2008) indicate that Special Olympics has had limited success with establishing Unified Sports programs and typically competitions are held at the same larger Special Olympics games which in and of themselves are segregated. It may be true that compared to the 3.1 million Special Olympics athletes overall, 150,000 athletes participating in Unified Sports is less impressive. The question to critics should be, ‘how many athletes with intellectual disabilities are playing in integrated competitions?’
fact, it is not possible to gather this information because these opportunities are not provided or accounted for by any single entity with the scope of Special Olympics.

One reason that Unified Sports does not attract the same level of participation as general Special Olympics chapters may be the use of divisioning. Divisioning is a form of segregation utilized in all Special Olympics competitions (Special Olympics, 2010g). Athletes are placed into different divisions based on age, skill level, and gender. This practice is not unique to Special Olympics or Unified Sports. It can be found in little leagues, K-12, college, professional, and recreational athletics. Divisioning allows competition to take place between athletes of similar skill levels and cohorts. It enables athletes to train with proper support, understanding, and acceptance. It promotes safety as older or more skilled athletes can not harm younger or less skilled athletes. It also promotes a competitive spirit and achievement motivation. According to Expectancy Theory, individual motivation is based on a person’s expectations for reward (Edwards, 1954; Atkinson, 1964; Wigfield & Eccles, 2000). In athletic terms this suggests that athletes are motivated if they perceive a chance for success and if success is not perceived as too easy. In short, athletes will want to play to their best ability if they perceive that they have a sporting chance at winning.

In today’s society, there are far fewer barriers than there were when Special Olympics first began. However, many individuals with significant disabilities who try to participate in integrated and open leagues are not finding themselves successful in competing against peers without disabilities. They therefore have fewer opportunities to improve their skills and potentially join the integrated team in the future. The exclusivity presented by divisioning is perhaps more important today than it was 40 years ago because it provides athletes with the opportunity to experience success, develop skills, and potentially gain the confidence to try out in open leagues.

Unified Sports has been more successful among athletes with higher skill levels perhaps because volunteers interested and equally skilled in a sport are not as readily available as the general population of volunteers willing to fund raise or participate on the day of an event. In addition, athletes who are perhaps less skilled in a sport than the general population, have been denied the opportunity to participate in integrated school and community settings. Individuals in the broader community had these opportunities over a life time, and those with less skill may have developed negative attitudes toward the sport therefore leaving them less willing to volunteer in this capacity. Individuals with intellectual disabilities may be happy to finally have the opportunity to play and asking a volunteer having higher skills to play down their skills in a competition would be demeaning to the athlete and perpetuate the negative stereotypes of the larger community.

It may be helpful to look beyond the practice of inclusion itself to the central goal behind the call for its implementation. If the goal of inclusion is acceptance, respect, understanding and friendship this happens more naturally in situations where individuals have a common interest and view themselves as competent participants in the activity. In many cases individuals with significant intellectual disabilities need self-esteem remediation to first understand that they have the potential for success, before they are motivated to risk trying an activity with others. Through its exclusivity Special Olympics provides athletes with the opportunity to train, compete, and experience success before they are persuaded to join more inclusive settings.

Beyond the lack of inclusive programming, Special Olympics has been criticized for reinforcing negative stereotypes toward individuals with intellectual disabilities. Media accounts and comments by famous individuals about Special Olympics have described athletes as kids, mentally retarded, and suffering. As previously presented in the programming information, Special Olympics has made a concerted effort to help educate the media and large society on appropriate language. This information is supplied directly to journalists and available on the organization’s website (Special Olympics, 2010h). It appears that critics would rather deny athletes the opportunity to compete than risk having the media or society perpetuate a misperception. As the Shriver family described in their letter to the Special Olympics family, Eunice Kennedy Shriver sought to allow to athletes with intellectual disabilities to reach their full potential so that the larger society might be forced to recognize our own false assumptions (Shriver, 2010). Without public, competitive events society can not bare witness to these capabilities. It is unfortunate that the media fails to appropriately articulate the events they cover, but it is not Special Olympics that should bear the blame.
Additional negative stereotyping for which Special Olympics is called to task hinges on the \textit{infantilization} or promotion of childlike perceptions of adults with intellectual disabilities. Among the specific concerns cited in the literature is the practice of hosting competitions in which athletes of different ages participate together and of having carnival-like activity areas to fill down time at events. In response to these criticisms it should be noted that athletes are placed in divisions based on age and therefore do not compete against athletes of significantly discrepant ages. This criticism is the equivalent of saying that wrestlers of different weight classes should not participate in the same tournament venue.

It should also be noted that most competitive sporting events including professional games and the Olympics themselves include recreational areas that take on a community fair or festival-like quality. The Olympics has an Olympic Village and professional teams hold promotional events such as bat and hat days. These events are typically enjoyed by individuals of all ages, regardless of their disability status, for their social function.

Special Olympics volunteer opportunities have also been heavily criticized; especially the use of \textit{huggers}. Although a number of veteran Special Olympic volunteers can recall participating on event days as \textit{huggers}, there is not reference to the term in any of the current print or online resources promoted by Special Olympics. This term may have appeared at one time as a way to brand or market Special Olympic volunteerism, but is apparently no longer encouraged. Hugging itself however is not absent from Special Olympics competition just as it is not absent from any exciting athletic event in which well-matched teams battle to games end, or an underdog competitor comes out victorious. Cheering, screaming, high fives, and hugging are present and valued by many Special Olympics athletes, as they are by general society.

Single event volunteering is still a core Special Olympics need and gateway into higher levels of volunteering. Individuals are needed to register teams and other volunteers, direct the flow of participants, set up, clean up, etc. Each registered volunteer is provided with a handbook that addresses sensitive topics including appropriate terminology and physical contact. Quite often family members and friends of athletes are recruited on the spot as volunteers. When these individuals get caught up in the lives of the athletes they came to see, cheering and hugging following their successes, it certainly does not violate norms related to social space and touching. In fact, it is a teachable moment for an appropriate celebration of life events.

As for the use of volunteers as coaches, assistant coaches, and board members these activities are very likely to promote positive perceptions toward individuals with intellectual disabilities. They meet all of the criteria for establishing lasting relationships including frequent interactions with a high probability of future exposure (Chadsley, 2007). The only missing component is the requirement for \textit{equal status} in the relationships. As Storey (2008) points out, coaches and board members without disabilities perpetuate a paternalistic relationship with athletes, suggesting that they are not capable of advocating for themselves. The coaching relationship inherent in sports does include an element of acquiescence to the coach. This occurs throughout the broader society and is a reality associated with quality team play. It is also a factor associated with employment, politics, and general democratic interplay. In our society it is beneficial for team members to have a voice but the coach, employer, elected official, etc. makes the guiding decisions for the group, such is also the case in sport. The SO volunteers serving as coaches and board members are often leaders in the business world. The interactions they have through Special Olympics may change their perceptions and lead them to hire athletes as their employees. This would, of course, perpetuate the paternalistic relationship into the work world but as stated before this is a common experience of the broader working society.

This fact of life does not suggest that individuals with intellectual disabilities should not be supported in their efforts to rise to these levels of leadership. Special Olympics provide opportunities for athletes to serve as coaches, assistant coaches, team captains, and board members through the Athlete Leadership and Global Messenger programs. Florence Nabayinda, a Special Olympics Athlete from Uganda, sits on the International Special Olympics Board of Directors and is an alumnus of the Global Messenger program. Loretta Claiborne, a Special Olympics runner, holds ESPN’s Espy Arthur Ashe award for courage and an honorary doctorate from Quinnipiac College. Ms. Claiborne is a motivational speaker and serves on the Special Olympics Partnership Board. She participated in the First Global Athlete Congress, planning the 2003 World Games. The Third Global Athlete Congress met in Marrakech, Morocco in June 2010 with more than 60 athletes from 35 different countries. These athletes have
participated in the Global Messenger program and serve on this strategic planning arm of the organization focused on improving and expanding Special Olympic programming. In response to critics, Special Olympics makes a concerted effort to support athletes in their own advocacy and that of their peers.

A final criticism of the Special Olympics movement is the lack of research supporting its impact on the lives of athletes. Special Olympics actually brands itself as the leader in cutting-edge research and evaluation to better understand the many challenges faced by people with intellectual disabilities and the significant impact of Special Olympics on their lives (Special Olympics, 2010i, para. 1). Special Olympics has conducted a number of large-scale assessments on the impact of its programs on athletes, families, and society. SO funds research grant opportunities for students studying in the health and social science professions. In addition to direct assessment of its programs, Special Olympics is a leading the way in sharing research that directly impacts the lives of individuals with disabilities. Their efforts have led to policy changes, funding appropriations, and international partnerships that extend well beyond the scope of sports and into health care, education, and employment issues faced by individuals with intellectual disabilities. For extensive information on the research conducted by Special Olympics visit their website (Special Olympics, 2010i).

Storey’s (2008) concern that the research does not support Special Olympics programming over more integrated opportunities may be accurate, however these opportunities are not widely available for comparison, and Special Olympics is not the impediment to starting these integrated programs. In fact, their research on Unified Sports is leading the way (Special Olympics, 2010j, 2010k).

Although the scholarly research has not yielded much in the way of comparison studies between Special Olympics and more integrated sport-focused programs, in the last five years alone there have been numerous studies of the impact of Special Olympics on athletes, families, and the general public. Studies of SO impacts on athlete participation, fitness, health, self-concept, and development demonstrate generally positive results (Hild, Hey, Baumann, Montgomery, Euler, Neumann, 2008; Sinha, Montgomery, Herer, McPherson, 2008; Weiss & Bebko, 2008; Gillespie, 2009; Harada & Siperstein, 2009; Tedrick, 2009; Tamse, Tillman, Stopka, Weimer, Abrams & Issa, 2010). Studies have also identified improving attitudes of the general public (Townsend & Hassall, 2007; Conaster, Naugle, Tillman, Stopka, 2009) and mental health of athletes’ caregivers (Weiss & Diamond, 2005; Goodwin, Fitzpatrick, Thurmeier & Hall, 2006; Weiss, 2008).

Special Olympics programming may also combat the more general findings on sedentary life styles of youth and adults with intellectual disabilities. This research suggests that adults often remain in day habilitation facilities isolated from their peers and these centers have been negatively associated with physical activity (Emerson, 2005). Research further demonstrates that individuals with intellectual disabilities are often encouraged in their sedentary behaviors by well-intentioned individuals from their support system who see them as vulnerable or frail (Stanish, Temple, & Frey, 2006). Participating in Special Olympics programming enables the larger society to view athletes as competent and empowered individuals who engage in physical activity and sport as a social outlet just as their peers without disabilities (Frey, Buchanan, Rosser & Sandt, 2005).

**Conclusion**

Mayor Richard Daley said to Mrs. Kennedy Shriver on opening day of the First International Special Olympic Games You know, Eunice, the world will never be the same after this and he was certainly right. Special Olympics now offers opportunities to millions of youth and adults with intellectual disabilities around the world. In addition to sport training, they now have improved access to health care and leadership training. The larger society is also changing as a result of this movement. There are more integrated sports and recreational opportunities, including Unified Sports, and people are beginning to realize the impact of their language choices on the perceptions of others.

Special Olympics has faced a number of challenges in its attempts to improve opportunities for individuals with intellectual disabilities. As Mrs. Kennedy Shriver well understood at the time of her passing, the race for equality and social justice for this population is certainly not finished, but her vision for the Special Olympics movement lives on in the many volunteer and athlete participants.
Rather than discontinuing Special Olympics, as some critics have called for (Moon, 1994; Storey, 2008), it may be more productive to join a movement that has demonstrated success for more than 40 years, and help it to continue the vision of Eunice Kennedy Shriver to allow athletes to reach their full potential so that we might in turn be changed by them, forced to recognize our own false assumptions and their inherent gifts (Shriver, 2010, para. 1). It may also be less paternalistic to consider the desires of Special Olympics athletes for training and competition than it is to disregard their feelings and presume we know better.

Critics of the Special Olympics movement might better offer a model or example of athletic programming that does more to allow athletes with disabilities to change their understandings of themselves and the community’s perceptions of them. Storey and others are correct in identifying the availability of integrated and inclusive recreational opportunities. Presumably these programs are not openly discriminating but they are certainly underutilized by the population of individuals with intellectual disabilities. They are also not openly offering opportunities for those needing to develop their skills so that they may one day play at the level of competition of the broader community using their facilities. Following two decades of casting aspersions on Special Olympics (Hourcade, 1989; Storey 2004, 2008) critics should, by now, be able to suggest alternative programs, either in theory or active practice, with the potential to offer the same or better impacts for individuals with disabilities in the larger community.

**Biographical Note**

It is important to recognize our apparent biases in favor of Special Olympics at the outset. The primary author is a trained Special Olympics coach having volunteered for the organization for the past four years, and established college level programming to attract and prepare future volunteers for service to the organization. The co-author is an employee of Special Olympics New York, acting as its former Director of Outreach and current Director of Training. Balancing these admitted biases readers should note that the authors have a long history of advocacy for educational and community inclusion for individuals with disabilities; having studied under and with some of the most radical leaders of the inclusive movement, authored articles promoting inclusive practice, and serving in various direct advocacy capacities locally, nationally, and internationally.

**References**


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